

THE RELATIONSHIP BETWEEN MATERNAL VARIABLE
SCORES AND INFANT PERFORMANCE IN A NEGRO
EXPERIMENTAL STIMULATION TRAINING POPULATION

By

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The major objective of this study was to investigate the relationship of maternal variable scores of disadvantaged Negro mothers to the intellectual development of their two-year-old infants enrolled in a stimulation training program.

The scores of 39 infants on the three scales of the Bayley Scales of Infant Development [Psychomotor, Mental Development, and Task Oriented Behavior (Scheerer, 1967)] were used as criterion variables. The following maternal variables were part of the scales and measurement instruments used by the Early Child Stimulation through Parent Education project (Gordon, 1969) to assess growth and development of the mother and her child: (a) How I See Myself Scale (Gordon, 1968), a self-report scale consisting of the factors Autonomy, Interpersonal Adequacy, Physical Appearance, and Attitudes toward Teacher-School; (b) Social Reaction Inventory (Eilker, 1968), a modification of the Rotter (1966) Internal-External Scale; (c) Mother's Attitude Scale (Herman, 1968), using items indicative of maternal attitude toward the training project; (d) Maternal Verbal Positive Interaction-Maternal Verbal Negative

Interaction Scale (Maurelli, 1969) scored on observed frequencies of growth producing and non-growth producing verbal behavior of the mother.

The results of stepwise discriminant function analyses and stepwise multiple regression analyses yielded the following major findings:

1. High-scoring children differed significantly from low-scoring children in their pattern of maternal variable scores only on the Mental scale. The discriminant variables were Mother Attitude and Social Reaction Inventory. For all three Bayley Scales, the high-scoring group had a higher Mother Attitude and a more external Social Reaction Inventory score.
2. High-scoring females differed significantly from low-scoring females on the Motor and Task Oriented Behavior scales. For the Motor scale, the only discriminant variable was Positive Verbal Interaction. For the Task Oriented Behavior scale, three of the How I See Myself factors and Positive Verbal Interaction discriminated significantly. The high-scoring group showed trends of higher scores on all three scales of Physical Appearance, lower scores on Teacher-School Attitude, higher external Social Reaction Inventory scores, lower Positive and Negative Verbal Interaction scores, and higher Mother Attitude scores.
3. High-scoring males differed significantly from low-scoring males in their pattern of maternal variable scores on the Mental and Motor scales. The most important discriminants for each scale were Positive Verbal Interaction, Mother Attitude, and Teacher-School Attitude. For all three scales,

the high-scorers had higher maternal Interpersonal Adequacy scores, higher Positive and Negative Verbal Interaction scores, and higher Mother Attitude scores.

4. High-scoring males differed from high-scoring females in their patterns of maternal variable scores on all three Bayley scales. Positive Verbal Interaction, Interpersonal Adequacy, and Mother Attitude were major discriminators for all three scales, although all the other maternal variables also contributed to the discrimination pattern. Trends indicated higher maternal variable scores and a more internal Social Reaction Inventory score for the males.
5. Low-scoring males differed from low-scoring females in their patterns of maternal variable scores on the Mental and Motor scales. Low-scoring males tended to have mothers who scored higher on all four of the How I See Myself factors, and lower on Positive Verbal Interaction. There were fewer distinctions between low-scoring groups than between high-scoring groups.
6. For the total group, the most important variables for prediction of child performance were Verbal Interaction scores. There was a positive correlation between Positive and Negative Verbal Interaction. Positive Verbal Interaction and Mother Attitude correlated positively with the Mental and Motor scales. For females, Positive and Negative Verbal Interaction and Mother Attitude were the most important predictors of performance on all three Bayley scales.

Maternal variables appeared to be more important for the males as predictors of performance. More of the maternal variables were involved in the prediction equation for the male group. Positive Verbal Interaction contributed most to the prediction, followed by the four measures of the How I See Myself Scale. For the males, there were significant Positive and Negative Verbal Interactions and Maternal Attitude scores.

Suggestions for future research were made, based on the findings and shortcomings of the study. More detailed studies of the kinds of verbalizations between mother and child were recommended, as well as studies of their non-verbal communication. Refinement of the measurement of maternal behaviors was suggested. Investigation into the differing maternal behaviors toward males and females, and the role of maternal variables as they relate to the mother as a teacher were considered.

CHAPTER I

Introduction and Review of the Literature

The interest and attention of workers in the field of child development have increased sharply in exploring the early years of the child's life. From the work of such early childhood investigators as Hunt (1964), Bloom (1964), and Bayley (1965, 1966), it has become evident that the infant develops enduring and consistent learning patterns which are, in considerable part, dependent upon the environment.

Consideration of the life experiences of the child as he interacts with his environment enables us to develop a more complete explanation for his intellectual development. Intelligence reflects the total organization of the person as it is influenced by his life experiences. Gordon (1969) has proposed a transactional theory of child development. He views the child as an open energy system, simultaneously influencing and influenced by his environment. The child is characterized by activity and organizes and integrates his activities into more and more complex behaviors as he develops. "Significant others" (Sullivan, 1953) are a part of the environment of the child. They interact with and mediate the child's other contacts with his environment (Figure 1).

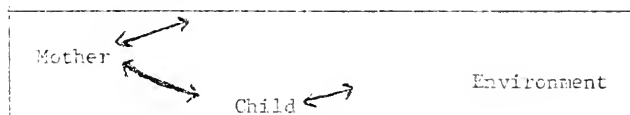


Figure 1: Interactive influence of child-mother-environment transactions.

The mother as a significant person in the life of the young child has strong and enduring influences on the behavior and development of her child. It is apparent from the literature that there are different sex-linked rearing patterns, and that boys and girls react differently to similar maternal behaviors.

It is the purpose of the study to investigate the relationships between maternal variables and intellectual child performance in Negro children. An investigation to determine patterns of maternal variable scores which differentiate between high-scoring and low-scoring males and females will allow for an expansion of knowledge of the differential effects of maternal behavior on the intellectual development of males and females.

Differences between Negro and white intelligence and achievement have been frequently identified by researchers (Klineberg, 1963; Kennedy, et al., 1963; Deutsch and Brown, 1964). At the same time, the literature stresses the influence of the early years of childhood on cognitive development. There is a need for examining the early years of the Negro child, the nature of his environment, and its relationship to intellectual development. Since the mother is the most significant person in the life of the young child, investigation of the role of maternal factors in the early life of the Negro child should enable child development researchers to expand their understanding of mother-child-environment interactions in the Negro family. Baratz and Baratz (1970, p. 17) conclude that "...a research program... must be launched in order to discover the different, but not pathological, norms of Negro behavior."

Importance of the Early Period of Child Development as Related to Intellectual Development

Investigations of child development have been strongly influenced by the findings implying the critical nature of early experience for subsequent development. Deutsch (1964) feels that appropriately organized cognitive stimulation during the early years can be highly effective in accelerating the development of intellectual functions. Newborn infants have been found to discriminate sound at six days of age (Kessen, et al., 1961), and vocalizations of children have been conditioned at three months of age (Rheingold, 1961).

Loretan (1966) stressed that any of the early years spent in a poor environment are almost irretrievable. Lewis (1963) stresses the significance of the first three years of life in the future cognitive and creative development of the child. He states that the process of the growth of meaning during the second year of life is a complex interaction of cognitive and affective factors. Affect and cognition act together as a selective influence upon the child's perceptions of his environment. Griffiths (1954, p. 26) suggested that "the first year lays the groundwork for mental development in all aspects." It is the beginning of imitation, purposeful communicative expression, and listening.

Sigel (1964) stated that one of the reasons why children from disadvantaged homes have difficulty in kindergarten and first grade is that they have not had appropriate stimulation during the early years. Hunt (1966) emphasizes the crucial role of early experience. The differential experiences of a cultural group have profound effects on

children's intelligence (Boger and Ambron, 1969). As a group, black children score lower than white children, and as the black child gets older, his measured intelligence decreases (Stodolsky and Lesser, 1967; Deutsch and Brown, 1964; Kennedy, Van de Reit, and White, 1963). Small differences in intelligence have been shown between black and white infants, but as children grow older, the difference between black and white intelligence scores increases (Dregor and Miller, 1960).

Several investigations (Rheingold, 1961; Sayegh and Dennis, 1965; Caslet, 1965; White, Castle and Held, 1964) have demonstrated the feasibility of positively altering early development through introducing stimulation programs for institutionalized infants. Caldwell (1967) found that gains made by a stimulation group of infants were sustained into adult life, while all but one of the control subjects who remained institutionalized developed classic syndromes of mental retardation.

Other investigations in the area of intellectual stimulation of infants from environmentally deprived situations have also demonstrated gains for the experimental groups on measures of intellectual functioning associated with increased levels of stimulation and training (Klaus and Gray, 1969; Kittrell, 1968; Gordon, 1969). However, the nature of the experiences which initiate adaptation to the environment and serve to stimulate development is not fully understood. Therefore, this study will investigate the relationship between maternal variable scores (as environmental variables) and performance of Negro infants on a standard test of infant intelligence.

Relationship of Maternal Variables to Intellectual Development of the Child

Characteristically, the mother has been considered as the key child-rearing person in the early years. Since one of the concerns of child development workers is for children growing up in homes where the father is absent, we need to examine what specific roles maternal behavior plays in influencing the child's intellectual development during his early years.

The family is viewed as a setting in which motivation for learning and development of achievement behaviors are initially developed. Maternal behavior toward the child is one critical variable in the early experience of the child. During infancy and early childhood there is a positive relationship between loving maternal behavior and happy, calm, positive behavior of the child (Schaefer and Bayley, 1963). Klatskin, Jackson, and Wilkin (1956) followed up 50 mothers in a three-year study of maternal attitudes. They found that the manner in which the mother related to the child, i.e., mother handling, was the major variable influencing child behavior in the first three years of life.

Bowlby (1951), Spitz (1965), and Erikson (1950) focus attention on the necessity for a one-to-one relationship with a great deal of attention from mothering one as the main ingredient of the mother-child relationship. According to Erikson, the development of the sense of basic trust and autonomy during the first two years of life is based in large measure upon positive mother-child interaction.

Hess, et al. (1968) discuss the social and physical environments which they feel shape behavior and compel adaptations which are in turn

transmitted to young children in interactions with adults, especially the mother. The exchange between the mother and child seems to be linked to the contingencies of the environment which the mother herself experiences.

Caldwell (1967) cites three conditions which she suggests constitute the optimal learning environment for the young child: (a) care in his own home; (b) a warm and nurturant emotional relationship with his mother or substitute; and (c) varied sensory and cognitive output.

Moss and Kagan (1964) reported on the Fels Research Institute Longitudinal Study which followed 36 males and 35 females from birth to adulthood. They found that maternal treatment from birth to three years of age was generally a better predictor of child and adult intellectual status based upon Stanford Binet test, observations, and interviews than was maternal treatment of child during subsequent periods of life.

Rupp (1969) suggests that stimulation of cognitive development also implies that the parents perceive development in their children. Parents then experience these developments as coming about in part due to their own influence. Perception of change implies the feeling that people and institutions can change and also that one is able to make a contribution to those changes.

Observations of family interactions and their effects upon the child are scarce. Hess and Shipman (1965) investigated the way in which mothers interacted with their children to see if language was related to cognitive development of the child. They found in their study of 160 mothers and their four-year-old children that there was

a relationship between the maternal cognitive style as measured by the Siegel test and child style and performance. They found "openness of mother to her child's questions" and "infrequency of imperative statements to the child without rationale" were positive predictors of a child's achievement.

Dye and Witkin (1963) used interviews with the mother in the home to rate her interaction as interfering with or fostering development of differentiation. In their view, the mother "as a person" was related to child style. The mother's self-assurance, self-realization, general social relationships, and attitudes of dependence and independence for the child correlated highly with the child's differentiation, defined as articulation of experience, analyzing and structuring of perception and thinking, a sense of separate entity, and structured specialized defenses in ten-year-old youngsters.

The following three studies report findings from the same population of indigent families who participated in the program, Early Child Stimulation Through Parent Education (Gordon, 1969). This was a program of intellectual stimulation exercises taught by mothers to their children from ages three months to two years of age.

Bilker (1970) found that mothers of children who score lower on an achievement test for two-year-olds change more in the direction of internal control of reinforcement as measured by the I-E Scale of the Rotter Social Reaction Inventory (SRI) than mothers of children who score higher. These mothers were trained in teaching cognitive stimulation exercises to their children. Positive or potentially growth producing verbalizations by the mother were significantly

related to internal expectancy changes in that direction. Gordon (1969) reports mothers who were more verbal on the same verbalization index had children who achieved more in the training program.

Bradshaw (1968) found that differences on observed maternal verbalization and disciplinary patterns do not seem to bear a significant relationship to the infant's ability to perform on a standardized intellectual performance test at age one. However, increases in maternal discipline demonstrated a relationship to higher performance on the Hand and Eye subtest of the Griffiths Scale of Mental Development.

It has been recognized that the dimension of control-autonomy is a significant axis of exchange in family dyads, especially in mother-child relationships (Baldwin, Klathorn, and Breese, 1949; Schaefer, 1959). Schaefer conceptualized maternal behavior along two axes, control-autonomy and hostility-love. In his study of home tutoring (1969), he found low negative correlations between maternal hostility and child performance on standardized measures of intellectual performance.

Data indicate that maternal teaching styles reflecting the mother's information-processing strategies, techniques for controlling her child's behavior, and her attitudes toward education and the schools are equal to or better than IQ and social class as predictors of the child's cognitive functioning. Use of rationales, especially appeals based on the individual characteristics of persons and situations, was related to better cognitive performance by both mother and child (Hess et al., 1968). Mothers who provided alternatives to behavior by stressing benefits to be obtained from participation in the task she was

teaching the child, and who provided specific, understandable, and useful information to the child were more successful in obtaining the child's interest and cooperation. The mother's conveying of positive attitudes toward education and school, and realistic expectations for the child's behavior were significant predictors of the child's performance on interaction tasks (Hess, et al., 1968).

Numerous relationships between variables of the family and environment have been revealed in current investigations (Hess, et al., 1968; Gordon, 1969); however, much further work remains in the search for understanding interactions in the deprived family.

The position of the American Negro leads to negative self-perceptions (Goff, 1949; Ausubel, 1963; Kvaraceus, 1965). Coleman (1966) emphasized the importance of the Negro's perceptions of inability to control his own environment. Studies by Rotter and associates show a high correlation between internal control and school achievement. They also reveal a relationship between internal control and affiliation and initiative in improving the conditions of school performance (Battle and Rotter, 1963; Gore and Rotter, 1963; Rotter, 1966). Freijo, Gordon, and Bilker (1968) investigated control expectancy in the Early Child Stimulation Through Parent Education project, and found a significant difference between Negro and white mothers. White mothers had a significantly lower (more internal) score on the Social Reaction Inventory. However, the same group of mothers investigated by Freijo were found to be low on the Autonomy factor. There was a low but significant correlation between the Interpersonal Adequacy factor of the How I See Myself Scale and the Social Reaction Inventory.

In summary, the importance of the mother in the early life of her child has been emphasized by the literature. Studies suggest differences in perceptions and behavior between white and Negro mothers. More investigations are needed in understanding the relationships between maternal behavior and child performance in Negro families. This study, therefore, will investigate relationships between maternal variable scores and intellectual development in two-year-old Negro children.

Influence of Sex Differences on Intelligence

Throughout the literature, sex has been consistently recognized as an important variable in the study of socialization processes. Sex differences in performance have also been noted. Becker (1964) reports that boys feel they get punished more than other members of the family; mothers are seen as more loving and nurturant than fathers; and mothers use more psychological control than fathers, especially with girls. Bradshaw (1968) reports a higher frequency of maternal verbalization with boys and a higher level of maternal discipline.

Schaefer (1966) demonstrated that inactive babies are more affected by deprivation than active babies. Moss (1966) studied male and female sleeping patterns among infants and found males awake and crying more of the time than females.

Bayley and Schaefer (1964) hypothesized that the female reaction to the experimental condition may be genetic. Boys' intelligence strongly related to the love-hostility dimension of maternal behavior, while girls' IQ correlated primarily with education of parents and estimation of mother's IQ.

Kagan and Moss (1962) reported on the longitudinal data of the Fels Research Institute. They divided childhood into three categories: birth to three years, three to six years, and six to ten years. Protection of boys during period one was one of the best predictors of child and adult intellectual achievement. It appears that the pattern most likely to lead to involvement in intellectual achievement in the male is early maternal protection, followed by encouragement and acceleration of mastery behaviors. For girls, the pattern was the reverse. Maternal hostility toward the daughter during the first three years of life, together with acceleration during ages six to ten, were associated with adult intellectual mastery in the female.

Honzik (1967) found that the intelligence of middle-class girls is related to parental competence and lack of conflict about discipline and cultural standards. For optimal mental growth, the boy appears to need first a warm, close relationship with a mother or caretaker, followed by a masculine model who not only achieves but who is concerned about his son's achievement. This raises the question of the influence on the child of a lack of male models in homes where there is no father or substitute.

Bing (1963) found significant differences for fifth-graders of both sexes between high and low verbals on early verbal stimulation, number of story books in the home, and participation in mealtime conversations. There was a difference between high and low verbal girls on observed maternal behavior, helping, approval, and pressure types of variables. Bradshaw (1968) studied a control group of one-year-old infants from indigent families, in order to observe mother-child behavior

and relate these behavior patterns to infant intellectual performance. These families were visited once a month by a parent educator who talked to the mother about the baby's progress. She found that boys obtained significantly higher scores on the Hand and Eye subtest of the Griffiths Mental Development Scale. Girls, however, scored higher on the Speech and Hearing subtest. The mothers in this supposedly homogeneous population behaved differently toward boys and girls on frequency of verbal interaction and amount of discipline.

The literature indicates that there are differences in intellectual performance by sex as well as by differing responses to maternal behaviors and stimulation training. Males and females react differently to maternal behaviors, and mothers behave differently toward boys and girls. More investigation is needed to increase our understanding of the ways in which maternal behaviors affect boys and girls as well as the reaction of specialized populations to maternal behavior and stimulation training. Therefore, this study will investigate the patterns of maternal variable scores of the mothers of males and females who score high and low on a standardized test of infant development in an experimental population of Negro families.

CHAPTER II

Design of the Study

The sample of subjects used in this study were 39 Negro infants and their mothers who have participated in the two-year experimental cognitive training program of the Early Child Stimulation Through Parent Education project (Gordon, 1969). Mothers and infants were identified at the birth of the child in the J. Hillis Miller Health Center Teaching Hospital of the University of Florida. The criteria for selection were: economic code of "indigent" on the hospital admission form; single birth; no breech or Caesarian delivery; no physical complications of mother or infant; no evidence of mental retardation; and no evidence of mother's mental illness. Assignment to experimental or control conditions was random. The first experimental group, E1, were born between June 15, 1966, and January 31, 1967. The second (E2) and third (C3) groups were born between May 1, 1967, and October 31, 1967. The racial composition of these groups was approximately 80 per cent Negro and 20 per cent white. The sample for this study will be the Negro subjects who received two years of stimulation training as part of either E1, E2, or C3 groups and on whom all of the data of mother variable scores and infant performance were available. The E1 and E2 groups were trained using series materials which stressed language development and modeling behavior for following directions more directly

while the C3 materials included more locomotor and physical development items. There were no significant differences in intellectual performance between the E2 and C3 groups.

Questions To Be Answered

1. Do the mothers of children with high scores on the Bayley Scales of Infant Development show a different pattern of maternal variable scores than mothers of children with low scores?
2. Do the mothers of females with high scores on the Bayley Scales of Infant Development show a different pattern of maternal variable scores than mothers of females with low Bayley scores?
3. Do the mothers of males with high scores on the Bayley Scales of Infant Development show a different pattern of maternal variable scores than mothers of males with low Bayley scores?
4. Do high-scoring males and high-scoring females differ in their patterns of maternal variable scores?
5. Do low-scoring males and low-scoring females differ in their patterns of maternal variable scores?
6. What relationships exist between the maternal variables in the male, female, and total groupings?

Procedures

The scores on the Bayley Scales of Infant Development, Mental Development Index and Psychomotor Development Index, and Schaefer's Task Oriented Behavior Index (TOB) were used as criterion variables. The sample was divided into high-scoring and low-scoring groups (by rank ordering the scores and using the top 50 per cent as the high group and the bottom 50 per cent as the low group) for the total sample, and by sex. A stepwise discriminant function analysis was used to distinguish between the high scorers and the low scorers on the basis of maternal variable scores. The following variables which were used are part of the scales and measurement instruments used by the Early Child Stimulation through Parent Education project (Gordon, 1969) to assess growth and development of mother and child.

a. How I See Myself (HISM): The HISM is a modification for mothers of Gordon's HISM (1968), which has been developed and norms established on children grades three through 12. The scale is a 40-item, five-point, self-report scale. Four of eight factors were used with mothers: Autonomy, consisting of nine items; Interpersonal Adequacy, consisting of 17 items; Physical Appearance, eight items; and Attitudes toward Teacher and School, six items. The modification of the scale for use with mothers consisted of changing those items which said girls or boys to women or men, and those having to do with teacher to past tense.

b. Social Reaction Inventory (SRI): This scale is a self-report inventory designed to assess attitudes toward mastery of the environment. The SRI was developed by Bilker (1970) as a modification

of the Rotter (1966) Internal-External Scale. The first step in the modification of this scale was changing the language to a fourth-grade vocabulary level. A test re-test reliability for this modified self-report measure was .78, about the same level as the original Rotter version.

c. Mother's Attitude (MA): This attitude scale was developed by Herman (1968), using items appearing on the Parent Educator Weekly Report (PEWR) as indicative of maternal attitude, and modified to include the PEWR section on missed appointments or delays. It was reasoned that a mother who could repeat exercises, knew what she was doing, watched demonstrations of the parent educator and brooked few interruptions would be considered as displaying a positive attitude. A mother who missed appointments for reasons other than illness, or seemed to be avoiding the parent educator would be scored as displaying a negative attitude, in addition to behaviors observed during the home visit. The items were converted into an attitude index with its parameters scored -1 score to a +1 score.

d. Estimate of Mother's Expectancy (EME): The EME was developed by McCaulley (1967), using Osgood's Semantic-Differential. For each concept to be described, a page was presented with sixteen adjective pairs to be rated on a scale from 1 to 7. The concepts used in this study are Ideal Baby Girl, Ideal Baby Boy, and This Child. Depending on the sex of the child, a distance score following Osgood, Suci, and Tannenbaum (1967) was computed for Ideal and This Child, using the 12 adjective pairs common to the three concepts.

e. Maternal Verbal Positive - Maternal Verbal Negative: Maurelli

(1969) developed a verbal score, using items from the PEWR. He divided the items into two categories based on the premise that the quality, as well as the amount of interaction, would yield important relationships with infant performance. For each visit, tallies were made of growth producing and non-growth producing verbal behavior of the mother. The maximum positive tallies for each visit is 11. The maximum negative tallies is four.

f. Bayley Scales of Infant Development: The Bayley Scales (Bayley, 1969) are designed to provide a three-part basis for the evaluation of a child's developmental status in the first two and one-half years of life. The Mental Scale is designed to assess sensory-perceptual acuities, discriminations, and the ability to respond to these; the early acquisition of object constancy; problem solving ability and early evidence of the ability to form generalizations and classification. The Motor Scale is designed to provide a measure of the degree of control of the body, coordination of the large muscles, and finer manipulator skills of the hands and fingers.

The test was standardized on a sample of 1,262 children from two through 30 months of age in the following strata of the United States population: sex, color, urban-rural residence, education, occupation, geographic region, and birth order. Split-half reliability coefficients for the Mental Scale range from .81 to .93, with a median value of .88. Reliability coefficients for the Motor Scale range from .68 to .92, with a median value of .84.

Schaefer's (1967) Task-Oriented Behavior Scale is adapted from the Bayley Infant Behavior Profile. The following items were rated

on a nine-point scale, except test adequacy, which is a five-point scale: 4. Object Orientation; 7. Goal Directedness; 8. Attention Span; 9. Cooperativeness; 6. Test Adequacy.

Statistics and Design

The statistical method used to analyze the data was a stepwise multiple discriminant function analysis. The method examines the group membership of individuals, based on a set of attributes of those individuals, in this case, maternal variable scores. The stepwise analysis allows for inspection of variables as they are added to the discriminant function equation in the order of highest discriminator. The analysis weights the different measured variables in such a way as to maximize the difference between the means of two composites derived from two criterion groups. This test allows examination of the nature of differences found using a matrix of F statistics.

Groups were rank-ordered and divided into high-scoring and low-scoring individuals, using the 50 per cent who scored highest, and the 50 per cent who scored lowest. There was an analysis done for each group, using each of the three Bayley Scale scores as the criterion variable (Mental, Motor, Task Oriented Behavior). Five groups were examined: total group -- high and low; females -- high and low; males -- high and low; high males and high females; low males and low females. A preliminary inspection was done to see if the same individuals scored high and low on the three scales. However, this was not found to be the case; therefore, each group was examined separately on each of the three scales.

A second set of discriminant function analyses was done in the manner described above for the E1 group alone, on whom the additional measure, Estimate of Mother's Expectancy, was available. In addition, intercorrelations of the maternal variables was examined, using a multiple correlation for the total group, for total females, and total males.

TABLE 1

N's for individual groups on the three scales of
the Bayley Scales of Infant Development

E1 group -- including the Estimate of Mother's Expectancy variable

<u>Bayley Scale</u>	<u>Group</u>	<u>Group</u>
Mental	1 High Females 6	4 Low Females 6
Motor	2 " " 6	5 " " 6
Task Oriented Behavior	3 " " 6	6 " " 6
Mental	7 High Males 8	10 Low Males 7
Motor	8 " " 8	11 " " 7
Task Oriented Behavior	9 " " 8	12 " " 7
Mental	13 Total High 14	16 Total Low 13
Motor	14 " " 14	17 " " 13
Task Oriented Behavior	15 " " 14	18 " " 13

E1, E2, C3 -- excluding the Estimate of Mother's Expectancy variable

<u>Bayley Scale</u>	<u>Group</u>	<u>Group</u>
Mental	19 High Females 8	22 Low Females 8
Motor	20 " " 8	23 " " 8
Task Oriented Behavior	21 " " 8	24 " " 8
Mental	25 High Males 12	28 Low Males 11
Motor	26 " " 12	29 " " 11
Task Oriented Behavior	27 " " 12	30 " " 11
Mental	31 Total High 20	34 Total Low 19
Motor	32 " " 20	35 " " 19
Task Oriented Behavior	33 " " 20	36 " " 19

CHAPTER III

Results

This study was designed to investigate the relationships between maternal variables, child performance, and sex in Negro children. These children and mothers were part of the experimental groups of a stimulation project using Piagetian-type exercises demonstrated to the mother by a paraprofessional parent educator and taught by the mother to her child.

The relationships between the various groups was tested, using a stepwise discriminant function analysis in order to test whether there were any differences in the pattern of mother variable scores between the groups.

Question One asked: Do the mothers of children with high scores on the Bayley Scales of Infant Development show a pattern of maternal variable scores different from children with low Bayley scores?

An examination of Table 2 shows that, of the three scales of the Bayley, only the Mental scale shows any significant discriminant pattern. On that scale, Mother Attitude and the Social Reaction Inventory are the only two variables which, together, discriminated between the two groups, 50 per cent high Bayley scores and 50 per cent low Bayley scores, at the .05 level of significance. Table 3 presents the means, standard deviations, and F tests for the difference between

TABLE 2

Stepwise Discriminant Function Analysis Summary for Maternal
Variable Scores and Bayley Scales of Infant Development

Total Group: N = 39

Low = 20

High = 19

Mental Scale

Variable	F Value to Enter	Number of Vari- ables Included	df	F
Attitude	6.618	1	1/37	6.618*
SRI	0.886	2	2/36	3.742*
Physical Appearance	0.886	3	3/35	2.782
Interpersonal Adequacy	0.529	4	4/34	2.191
Negative Verbal	0.164	5	5/33	1.742
Autonomy	0.226	6	6/32	1.456
Positive Verbal	0.097	7	7/31	1.226
Teacher-School	0.089	8	8/30	1.053

Motor Scale

Variable	F Value to Enter	Number of Vari- ables Included	df	F
Attitude	3.736	1	1/37	3.736
Physical Appearance	1.418	2	2/36	2.598
Autonomy	1.742	3	3/35	2.348
SRI	1.887	4	4/34	2.278
Negative Verbal	1.000	5	5/33	2.022
Teacher-School	2.060	6	6/32	2.083
Positive Verbal	0.236	7	7/31	1.776
Interpersonal Adequacy	0.000	8	8/30	1.504

Task Oriented Behavior Scale

Variable	F Value to Enter	Number of Vari- ables Included	df	F
Teacher-School	2.534	1	1/37	2.534
SRI	1.334	2	2/36	1.945
Negative Verbal	1.034	3	3/35	1.643
Physical Appearance	0.724	4	4/34	1.403
Interpersonal Adequacy	0.279	5	5/33	1.133
Attitude	0.042	6	6/32	0.941
Positive Verbal	0.041	7	7/31	0.788
Autonomy	0.000	8	8/30	0.668

* $p < .05$

TABLE 3

Means, Standard Deviations, and F Tests for Maternal Variables

TOTAL GROUP

Mental Scale

Variable	Low Group		High Group		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	22.899	5.524	24.000	4.027	0.500
Interpersonal Adequacy	61.950	11.245	60.157	17.661	0.144
Physical Appearance	27.649	4.704	28.578	6.318	0.273
Teacher-School	22.399	6.500	22.105	3.857	0.029
SRI	9.600	3.050	10.421	3.877	0.543
Positive Verbal	0.592	0.274	0.710	0.171	2.560
Negative Verbal	0.162	0.122	0.203	0.147	0.889
Attitude	0.494	0.267	0.673	0.145	6.618*

Motor Scale

Variable	Low Group		High Group		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	24.200	4.640	22.631	5.002	1.031
Interpersonal Adequacy	60.700	13.890	61.473	15.593	0.026
Physical Appearance	27.349	4.671	28.894	6.279	0.763
Teacher-School	23.099	5.848	21.368	4.669	1.037
SRI	9.550	3.332	10.473	3.611	0.690
Positive Verbal	0.588	0.255	0.714	0.196	2.995
Negative Verbal	0.152	0.122	0.213	0.144	2.623
Attitude	0.514	0.257	0.581	0.183	3.736

Task Oriented Behavior Scale

Variable	Low Group		High Group		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	23.349	5.135	23.526	4.637	0.012
Interpersonal Adequacy	61.849	15.395	60.263	13.853	0.113
Physical Appearance	27.649	3.881	28.573	5.214	0.273
Teacher-School	23.549	4.748	20.894	5.605	2.534
SRI	9.420	3.948	10.378	2.910	1.040
Positive Verbal	0.641	0.241	0.658	0.233	0.044
Negative Verbal	0.173	0.138	0.191	0.135	0.181
Attitude	0.564	0.225	0.660	0.243	0.220

* $p < .05$

means of each variable for the two groups. As in Table 2, the only variable which discriminates significantly between the two groups is the Mental scale. Mother Attitude differentiates between the two groups at the .05 level of significance. The 19 cases of the high-scoring group showed the following trends: higher Physical Appearance score, lower Teacher-School Attitude scores, more external Social Reaction Inventory orientation, more Positive Verbal Interaction between mother and child, more Negative Verbal Interaction, and higher Maternal Attitude. The Mental and Task Oriented Behavior scales show, for the high-scoring group, a higher Autonomy score and a lower Interpersonal Adequacy score, while the Motor scale shows the opposite trend for Autonomy and Interpersonal Adequacy.

Question Two asks: Do the mothers of females with high scores on the Bayley Scales of Infant Development show a different pattern of maternal variable scores than mothers of females with low Bayley scores?

An examination of Table 4 shows that no significant relationships were found for the Mental scale. For the Motor scale, the only variable which discriminated was Positive Verbal Interaction, at the .05 level of significance. On the Task Oriented Behavior scale, a combination of Positive Verbal Interaction, Teacher-School Attitude, Interpersonal Adequacy, and Autonomy discriminated at the .05 level. Table 5 shows that, for the Motor and Task Oriented Behavior scales, the Positive Verbal Interaction variable showed a significant difference between the two groups at the .05 level of significance. Trends between the two groups show that, for all three scales, the high-scoring group had higher Physical Appearance scores, lower Teacher-School

TABLE 4

Stepwise Discriminant Function Analysis Summary for Maternal
Variable Scores and Bayley Scales of Infant Development

Females: N = 16

Low = 8

High = 8

Mental Scale

Variable	F Value to enter	Number of Vari- ables Included	df	F
SRI	1.732	1	1/14	1.732
Interpersonal Adequacy	2.458	2	2/13	2.186
Physical Appearance	1.697	3	3/12	2.101
Attitude	2.372	4	4/11	2.349
Positive Verbal	3.933	5	5/10	3.167
Negative Verbal	3.326	6	6/9	3.807
Autonomy	0.334	7	7/8	3.070
Teacher-School	0.215	8	8/7	2.449

Motor Scale

Variable	F Value to enter	Number of Vari- ables Included	df	F
Positive Verbal	5.398*	1	1/14	5.398
SRI	1.748	2	2/13	3.717
Autonomy	1.816	3	3/12	3.239
Teacher-School	0.991	4	4/11	2.675
Interpersonal Adequacy	0.664	5	5/10	2.208
Negative Verbal	1.605	6	6/9	2.219
Physical Appearance	1.216	7	7/8	2.121
Attitude	0.538	8	8/7	1.816

Task Oriented Behavior Scale

Variable	F Value to enter	Number of Vari- ables Included	df	F
Positive Verbal	7.737	1	1/14	7.737*
Teacher-School	2.650	2	2/13	5.650*
Interpersonal Adequacy	1.520	3	3/12	4.424*
Autonomy	0.944	4	4/11	3.539*
Attitude	1.520	5	5/10	3.261
Physical Appearance	0.415	6	6/9	2.628
SRI	0.537	7	7/8	2.213
Negative Verbal	0.369	8	8/7	1.840

* p < .05

TABLE 5

Means, Standard Deviations, and F Tests for Maternal Variables

FEMALES

Mental Scale

Variable	Low Group		High Group		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	21.875	4.486	22.500	3.380	0.099
Interpersonal Adequacy	61.250	9.881	52.375	18.007	1.493
Physical Appearance	25.375	3.622	27.250	4.773	0.783
Teacher-School	20.750	5.548	20.625	4.657	0.002
SRI	9.000	3.505	11.500	4.070	1.732
Positive Verbal	0.682	0.206	0.598	0.181	0.742
Negative Verbal	0.167	0.121	0.154	0.092	0.052
Attitude	0.517	0.233	0.604	0.165	0.740

Motor Scale

Variable	Low Group		High Group		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	23.575	2.199	21.000	4.869	1.580
Interpersonal Adequacy	55.375	14.908	58.250	15.489	0.143
Physical Appearance	24.875	3.482	27.750	4.590	1.191
Teacher-School	21.250	3.770	20.125	6.128	0.195
SRI	8.500	4.276	12.000	2.672	3.853
Positive Verbal	0.738	0.142	0.542	0.192	5.398*
Negative Verbal	0.189	0.124	0.132	0.763	1.218
Attitude	0.579	0.205	0.541	0.207	0.139

Task Oriented Behavior Scale

Variable	Low Group		High Group		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	23.125	2.100	21.250	5.035	0.944
Interpersonal Adequacy	58.000	16.071	55.625	14.332	0.097
Physical Appearance	25.875	3.681	26.750	4.891	0.163
Teacher-School	22.125	3.482	19.250	5.970	1.384
SRI	9.250	3.494	11.250	4.234	1.061
Positive Verbal	0.751	0.166	0.529	0.152	7.737
Negative Verbal	0.171	0.123	0.149	0.067	0.166
Attitude	0.588	0.224	0.533	0.184	0.284

*p < .05

Attitude scores, more external Social Reaction Inventory scores, lower Positive Verbal Interaction scores, lower Negative Verbal Interaction scores, and higher Maternal Attitude scores. The Motor and Task Oriented Behavior scales showed lower autonomy scores for the high group, while the Mental scale showed a higher Autonomy score for the high group. The Mental and Task Oriented Behavior scales showed lower Interpersonal Adequacy scores, while the Motor scale showed higher Interpersonal Adequacy scores.

Question Three concerned itself with the mother of males on the Bayley scales, asking: Do mothers of males with high scores on the Bayley Scales show a different pattern of maternal variable scores than mothers of males with low scores?

Table 6 summarizes the information on the three scales. On the Mental scale, Positive Verbal Interaction, Mother Attitude, Teacher-School Attitude, Social Reaction Inventory, and Negative Verbal Interaction scores discriminate between the two groups at the .01 level of significance. The addition of Autonomy, Physical Appearance, and Interpersonal Adequacy continued to be significant at the .05 level. On the Motor scale, Positive Verbal Interaction, Teacher-School Attitude, Negative Verbal Interaction, and Mother Attitude discriminate at the .01 level of significance. The addition of Interpersonal Adequacy and Autonomy continued to be significant at the .05 level. There was no significant pattern of discrimination for the Task Oriented Behavior Scale.

Table 7 shows that, for the Mental and Motor scales, Positive Verbal Interaction scores showed a significant difference between high

TABLE 6

Stepwise Discriminant Function Analysis Summary for Maternal
Variable Scores and Bayley Scales of Infant Development

Males: N = 23

Low = 12

High = 11

Mental Scale

Variable	F Value to enter	Number of Vari- ables Included	df	F
Positive Verbal	14.248	1	1/24	14.248**
Attitude	5.110	2	2/20	11.074**
Teacher-School	0.887	3	3/19	7.630**
SRI	0.834	4	4/18	5.881**
Negative Verbal	0.834	5	5/17	4.564**
Autonomy	0.283	6	6/16	3.691*
Physical Appearance	0.204	7	7/15	3.035*
Interpersonal Adequacy	1.430	8	8/14	2.911

Motor Scale

Variable	F Value to enter	Number of Vari- ables Included	df	F
Positive Verbal	12.434	1	1/21	12.434**
Teacher-School	1.228	2	2/20	6.898**
Negative Verbal	2.381	3	3/19	5.710**
Attitude	1.725	4	4/18	4.877**
Interpersonal Adequacy	0.546	5	5/17	3.913*
Autonomy	0.078	6	6/16	3.097*
SRI	0.069	7	7/15	2.310
Physical Appearance	0.014	8	8/14	2.054

Task Oriented Behavior Scale

Variable	F Value to enter	Number of Vari- ables Included	df	F
Positive Verbal	2.344	1	1/21	2.344
Interpersonal Adequacy	3.082	2	2/20	2.829
Teacher-School	2.564	3	3/19	2.888
Physical Appearance	1.260	4	4/18	2.511
Autonomy	0.844	5	5/17	2.160
Attitude	0.795	6	6/16	1.911
Negative Verbal	0.350	7	7/15	1.621
SRI	0.006	8	8/14	1.325

* p < .05

** p < .01

TABLE 7

Means, Standard Deviations, and F Tests for Maternal Variables

MALES

Mental Scale

Variable	Low Group		High Group		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	24.750	5.047	23.818	5.776	0.170
Interpersonal Adequacy	63.083	12.098	65.090	15.591	0.113
Physical Appearance	29.416	4.640	29.272	7.471	0.003
Teacher-School	22.166	3.433	24.636	6.874	1.220
SRI	10.083	2.968	9.545	3.559	0.155
Positive Verbal	0.499	0.276	0.827	0.084	12.248**
Negative Verbal	0.168	0.115	0.228	0.187	0.871
Attitude	0.509	0.309	0.691	0.140	3.172

Motor Scale

Variable	Low Group		High Group		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	24.416	5.869	24.181	4.895	0.010
Interpersonal Adequacy	63.833	12.349	64.272	16.149	0.005
Physical Appearance	29.083	4.737	29.636	7.392	0.046
Teacher-School	24.000	6.728	22.636	3.585	0.357
SRI	9.583	2.745	10.090	3.753	0.138
Positive Verbal	0.505	.01	0.820	0.101	12.343**
Negative Verbal	0.139	0.121	0.260	0.165	4.048
Attitude	0.480	0.289	0.723	0.134	6.509*

Task Oriented Behavior Scale

Variable	Low Group		High Group		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	23.916	5.680	24.727	5.100	0.123
Interpersonal Adequacy	60.333	16.120	68.090	10.406	1.840
Physical Appearance	28.416	6.052	30.363	6.087	0.590
Teacher-School	24.666	6.386	21.909	3.806	1.344
SRI	3.916	2.712	9.727	3.797	0.019
Positive Verbal	0.577	0.259	0.741	0.252	2.344
Negative Verbal	0.189	0.158	0.205	0.155	0.059
Attitude	0.564	0.275	0.631	0.240	0.378

* $p < .05$ ** $p < .01$

males and low males at the .01 level. For the Motor scale, Mother Attitude also showed a significant difference at the .05 level. The following trends were observed between the groups. For all three scales, the high-scoring males had higher Interpersonal Adequacy scores, higher Negative Verbal scores, and Higher Attitude scores. The Mental and Motor scales showed lower Autonomy scores for the high-scoring group, while the Task Oriented Behavior scale showed higher Autonomy scores. The Motor and Task Oriented Behavior scales showed higher Physical Appearance scores and lower Teacher-School Attitude scores, while the Mental scale showed lower Physical Appearance scores and higher Teacher-School Attitude scores. The Mental and Task Oriented Behavior scales showed more internal Social Reaction Inventory scores for the high Bayley scorers, while the high-scoring Motor group showed more external scores.

Question Four asked: Do high-scoring males and high-scoring females differ in their patterns of maternal variable scores?

Table 8 summarizes the discriminant function analysis data. For the Mental scale, Positive Verbal Interaction, Interpersonal Adequacy, Teacher-School Attitude, Mother Attitude, Autonomy, Physical Appearance, Negative Verbal Interaction, and Social Reaction Inventory scores (all the factors in that order) provide discrimination between the two groups at the .01 level of significance. For the Motor scale, Positive Verbal Interaction, Interpersonal Adequacy, Physical Appearance, and Mother Attitude discriminate at the .01 level. Adding Negative Verbal Interaction, Autonomy, and Social Reaction Inventory continues to show significant discrimination at the .05 level. The Task Oriented

TABLE 8

Stepwise Discriminant Function Analysis Summary for Maternal
Variable Scores and Bayley Scales of Infant Development

High-Scoring: N = 19

Female = 8

Male = 11

Mental Scale

Variable	F Value to enter	Number of Vari- ables Included	df	F
Positive Verbal	13.536	1	1/17	13.836**
Interpersonal Adequacy	8.443	2	2/16	14.168**
Teacher-School	3.050	3	3/15	11.673**
Attitude	3.099	4	4/14	10.755**
Autonomy	2.554	5	5/13	10.070**
Physical Appearance	5.236	6	6/12	12.015**
Negative Verbal	1.563	7	7/11	11.006**
SRI	0.831	8	8/10	9.586**

Motor Scale

Variable	F Value to enter	Number of Vari- ables Included	df	F
Positive Verbal	16.912	1	1/17	16.912**
Interpersonal Adequacy	1.698	2	2/16	9.653**
Physical Appearance	1.029	3	3/15	6.780**
Attitude	0.603	4	4/14	5.109**
Negative Verbal	0.997	5	5/13	4.286**
Autonomy	0.384	6	6/12	3.466*
SRI	0.810	7	7/11	3.040*
Teacher-School	0.409	8	8/10	2.568

Task Oriented Behavior Scale

Variable	F Value to enter	Number of Vari- ables Included	df	F
Interpersonal Adequacy	4.836	1	1/17	4.836*
Positive Verbal	4.885	2	2/16	5.413*
Attitude	3.514	3	3/15	5.347*
Autonomy	4.870	4	4/14	6.263**
Physical Appearance	2.378	5	5/13	5.979**
SRI	2.925	6	6/12	6.208**
Teacher-School	0.264	7	7/11	5.033**
Negative Verbal	0.094	8	8/10	4.053*

* p < .05

** p < .01

Behavior scale shows the following combination of factors discriminate at the .01 level: Interpersonal Adequacy, Positive Verbal Interaction, Mother Attitude, Autonomy, Physical Appearance, Social Reaction Inventory, and Teacher-School Attitude. Negative Verbal Interaction added to the list continues to discriminate at the .05 level.

Table 9 shows significant differences between high-scoring males and high-scoring females for Positive Verbal Interaction, at the .01 level for the Mental and Motor scales, and Mother Attitude at the .05 level for the Motor scale. The Task Oriented Behavior scale shows a significant difference between the two groups for the Interpersonal Adequacy factor at the .05 level. The following trends are indicated in Table 9 for all three scales for the high-scoring males: Higher Autonomy, higher Interpersonal Adequacy, higher Physical Appearance, higher Teacher-School Attitude, more internal Social Reaction Inventory, higher Positive Verbal Interaction, higher Negative Verbal Interaction, and higher Mother Attitude.

Question Five concerned itself with the low-scoring groups. It asked: Do low-scoring males and low-scoring females differ in their patterns of maternal variable scores?

Table 10 summarizes the discriminant function analysis for the Mental and Task Oriented Behavior scales. For the Mental scale, Physical Appearance, Interpersonal Adequacy, Positive Verbal Interaction, Mother Attitude, Autonomy, Teacher-School Attitude, and Negative Verbal Interaction discriminate at the .05 level. For the Motor scale, only the Positive Verbal Interaction score discriminates at the .05 level. There were no significant discriminators for the Task Oriented Behavior scale.

TABLE 9

Means, Standard Deviations, and F Tests for Maternal Variables

HIGH-SCORING GROUP

Mental Scale

Variable	Females		Males		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	22.500	3.386	23.818	5.776	0.330
Interpersonal Adequacy	52.375	18.007	65.090	15.591	2.708
Physical Appearance	27.250	4.773	29.272	7.471	0.448
Teacher-School	20.625	4.657	24.363	6.874	2.029
SRI	11.500	4.070	9.545	3.559	1.239
Positive Verbal	0.598	0.180	0.827	0.084	13.836*
Negative Verbal	0.154	0.092	0.228	0.187	1.039
Attitude	0.604	0.165	0.691	0.140	1.539

Motor Scale

Variable	Females		Males		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	21.000	4.869	24.181	4.895	1.965
Interpersonal Adequacy	58.250	15.489	64.272	16.149	0.666
Physical Appearance	27.750	4.590	29.636	7.392	0.403
Teacher-School	20.125	6.128	22.636	3.585	1.268
SRI	12.000	2.672	10.090	3.753	1.503
Positive Verbal	0.542	0.192	0.820	0.101	16.912**
Negative Verbal	1.132	0.763	0.260	0.165	4.084
Attitude	0.541	0.207	0.723	0.134	5.438*

Task Oriented Behavior Scale

Variable	Females		Males		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	20.750	4.682	24.727	5.100	3.010
Interpersonal Adequacy	55.500	14.628	68.090	10.406	4.836*
Physical Appearance	27.250	4.773	30.363	6.087	1.440
Teacher-School	18.750	5.574	21.909	2.806	2.168
SRI	12.125	2.748	9.727	3.797	2.297
Positive Verbal	0.558	0.197	0.741	0.252	2.917
Negative Verbal	0.143	0.075	0.205	0.155	1.077
Attitude	0.567	0.209	0.631	0.240	0.363

* $p < .05$ ** $p < .01$

TABLE 10

Stepwise Discriminant Function Analysis Summary for Maternal
Variable Scores and Bayley Scales of Infant Development

Low-Scoring: N = 20

Females = 8

Males = 12

Mental Scale

Variable	F Value to enter	Number of Vari- ables Included	df	F
Physical Appearance	4.292	1	1/18	4.292
Interpersonal Adequacy	2.661	2	2/17	3.674*
Positive Verbal	2.703	3	3/16	3.596*
Attitude	5.236	4	4/15	4.720*
Autonomy	1.752	5	5/14	4.316*
Teacher-School	0.663	6	6/13	3.620*
Negative Verbal	0.507	7	7/12	3.058*
SRI	0.112	8	8/11	2.457

Motor Scale

Variable	F Value to enter	Number of Vari- ables Included	df	F
Positive Verbal	4.687	1	1/18	4.687*
Physical Appearance	1.953	2	2/17	3.444
Teacher-School	1.225	3	3/16	2.735
Attitude	1.716	4	4/15	2/372
Negative Verbal	0.985	5	5/14	2.252
SRI	1.236	6	6/13	2.115
Interpersonal Adequacy	0.596	7	7/12	1.842
Autonomy	0.120	8	8/11	1.308

Task Oriented Behavior Scale

Variable	F Value to enter	Number of Vari- ables Included	df	F
Positive Verbal	1.983	1	1/18	1.983
Attitude	1.719	2	2/17	1.891
Teacher-School	1.159	3	3/16	1.659
Physical Appearance	1.379	4	4/15	1.618
Interpersonal Adequacy	1.242	5	5/14	1.564
SRI	0.450	6	6/13	1.327
Negative Verbal	0.432	7	7/12	1.150
Autonomy	0.344	8	8/11	1.000

* $p < .05$

Table 11 shows the significant differences between low-scoring females and low-scoring males for each variable. Only the Motor scale contained any variables which differed significantly between the two groups. Physical Appearance and Positive Verbal Interaction differed at the .05 level of significance. The following trends were indicated for the low-scoring males on all three Bayley scales: higher Autonomy, higher Interpersonal Adequacy, higher Physical Appearance, higher Teacher-School Attitude, more internal Social Reaction Inventory. The Mental and Task Oriented Behavior Scales showed low males with higher Negative Verbal Interaction scores, but the Motor scale showed them with lower Negative Verbal Interaction scores. The Motor and Task Oriented Behavior scales showed males higher on Mother Attitude, and the Mental scale showed males lower on Mother Attitude.

In summary, the results indicate that mother variable scores discriminate better for the males than for the females. Higher "How I See Myself" scores and more internal Social Reaction Inventory orientation (self-report scores of maternal variables) discriminated between high and low males, and between high males and females. Mother Attitude was higher for all the high performance groups. Higher Positive and Negative Verbal Interaction (more verbal interaction of both kinds) discriminated between males and females, both high-scoring and low-scoring.

Question Six asked: What relationships exist between the maternal variables in the male, female, and total groupings? A stepwise regression was used for each of the three groups to consider relationships between the variables. Each group was considered separately. The data are presented in Tables 12, 14, and 16.

TABLE 11

Means, Standard Deviations, and F Tests for Maternal Variables

LOW-SCORING GROUP

Mental Scale

Variable	Females		Males		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	21.875	4.486	24.750	5.049	1.695
Interpersonal Adequacy	61.250	9.881	63.083	12.098	0.115
Physical Appearance	25.375	3.622	29.416	4.640	4.292
Teacher-School	20.750	5.548	22.166	3.433	0.502
SRI	9.000	3.505	10.083	2.968	0.554
Positive Verbal	0.682	0.206	0.499	0.276	2.536
Negative Verbal	0.167	0.121	0.168	0.115	0.006
Attitude	0.517	0.232	0.509	0.309	0.003

Motor Scale

Variable	Females		Males		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	23.375	2.199	24.416	5.869	0.227
Interpersonal Adequacy	55.375	14.908	63.833	12.349	1.911
Physical Appearance	24.875	3.492	29.083	4.737	4.611*
Teacher-School	21.250	3.770	24.000	6.728	1.093
SRI	8.500	4.276	9.583	2.745	0.480
Positive Verbal	0.738	0.142	0.505	0.279	4.687*
Negative Verbal	0.189	0.124	0.139	0.121	0.806
Attitude	0.579	0.205	0.481	0.289	0.708

Task Oriented Behavior Scale

Variable	Females		Males		F Value
	Mean	S.D.	Mean	S.D.	
Autonomy	23.625	2.263	23.916	5.680	0.018
Interpersonal Adequacy	58.125	15.774	60.333	16.120	0.091
Physical Appearance	25.375	3.622	28.416	6.052	1.615
Teacher-School	22.625	3.583	24.666	6.386	0.668
SRI	8.375	4.103	9.916	2.712	1.033
Positive Verbal	0.722	0.157	0.577	0.259	1.983
Negative Verbal	0.178	0.129	0.189	0.158	0.026
Attitude	0.553	0.025	0.564	0.275	0.009

* $p < .05$

The Mental scale for the total group shows a multiple correlation using Mother Attitude and Negative Verbal Interaction to be significant at the .05 level. For the Motor scale, Positive Verbal Interaction, Interpersonal Adequacy and Social Reaction Inventory had a multiple R significant at the .01 level, and the increase for each step was also significant at the .01 level. Continued significance at the .05 level with significant increase for each step at the .05 level was found, using the Autonomy, Mother Attitude, and Negative Verbal Interaction variables. For the Task Oriented Behavior scale, none of the multiple R's were significant. It appears from this data that maternal variables can predict child performance for the Mental and Motor scales. For both these scales, the first variable entered and the one contributing most to the strength of prediction was a Verbal Interaction score. It is interesting to note, however, that for the Mental scale, this was Negative Verbal Interaction, while for the Motor scale, this was Positive Verbal Interaction.

Table 13 is a correlation matrix showing the relationship of each variable to each other variable used in the regression analysis for the total group. Negative Verbal Interaction correlated with Teacher-School Attitude significantly at the .05 level and with Positive Verbal Interaction at the .01 level. Mother Attitude correlated with Positive Verbal Interaction at the .01 level and with Negative Verbal Interaction at the .01 level. Both the Mental and the Motor scales correlated significantly with Positive Verbal Interaction and with Mother Attitude. The three Bayley scales intercorrelated with each other at the .01 level. It is interesting to note that the significant

TABLE 12

Stepwise Regression Summary for Maternal Variable Scores and
Bayley Scales of Infant Development

TOTAL GROUP

N = 39

Mental Scale

Variable Entered	Multiple R
Attitude	0.341*
Negative Verbal	0.373* b
Positive Verbal	0.391
Physical Appearance	0.395
SRI	0.397
Teacher-School	0.398
Autonomy	0.399

Motor Scale

Variable Entered	Multiple R
Positive Verbal	0.409** b
Interpersonal Adequacy	0.499** b
SRI	0.531** b
Autonomy	0.546* a
Attitude	0.558* a
Negative Verbal	0.563* a
Physical Appearance	0.565*
Teacher-School	0.566

Task Oriented Behavior Scale

Variable Entered	Multiple R
Teacher-School	0.228
Positive Verbal	0.279
SRI	0.319
Physical Appearance	0.328
Autonomy	0.332
Attitude	0.333
Negative Verbal	0.334

* p < .05

** p < .01

a - F ratio step increase p < .05

b - F ratio step increase p < .01

TABLE 13: Correlation Matrix -- Total Group, N = 39

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Autonomy	1.000	0.100	0.262	0.278	0.221	-0.026	0.179	-0.053	-0.039	-0.066	0.025
2. Interpersonal Adequacy		1.000	0.642	0.160	-0.032	-0.200	-0.261	-0.137	-0.034	0.199	-0.021
3. Physical Appearance			1.00	0.072	-0.011	-0.100	-0.125	-0.137	-0.092	0.164	0.037
4. Teacher-School Social Reaction				1.000	0.067	0.059	0.376*	0.038	-0.032	0.036	-0.229
5. Inventory					1.000	-0.106	0.117	-0.057	-0.015	0.119	0.119
6. Positive Verbal						1.000	0.413**	0.746**	0.314*	0.409**	0.147
7. Negative Verbal							1.000	0.450**	0.018	0.206	0.017
8. Attitude								1.000	0.341*	0.381*	0.130
9. Bayley Mental Scale									1.000	0.515**	0.672**
10. Bayley Motor Scale										1.000	0.590
11. Bayley Task Oriented Behavior											1.000

* $p < .05$ ** $p < .01$

correlations occur between both the Verbal Interaction scores, Mother Attitude, and the Mental and Motor scales of the Bayley.

For the total female group, Table 14, the Mental scale, shows a multiple R significant at the .05 level with Mother Attitude, Positive Verbal Interaction, Interpersonal Adequacy, Physical Appearance, and Negative Verbal Interaction. The increases provided by steps three, four, and five were significant at the .05 level. For the Motor scale, the multiple R was significant at the .05 level, using the following variables: Positive Verbal Interaction, Mother Attitude, Physical Appearance, and Negative Verbal Interaction. Increases at steps three and four were significant at the .05 level. The Task Oriented Behavior scale showed significance at the .01 level in step six with the following variables: Positive Verbal Interaction, Mother Attitude, Teacher-School Attitude, Autonomy, Physical Appearance, and Interpersonal Adequacy. Increase at this step was significant at the .05 level. For all three Bayley scales, the two major contributors to the multiple prediction equation were Mother Attitude and Positive Verbal Interaction.

The correlation matrix, Table 15, shows the only significant intercorrelations for females were between the Mental and Motor scales, ($p < .05$), and the Task Oriented Behavior and Motor scales ($p < .05$). There were no significant correlations between the maternal variables for the females.

The regression summary for males (Table 16), shows a multiple correlation of .01 for the Mental scale, using all eight variables, each addition significant at the .01 level for steps three through eight. The Motor scale showed significant multiple R's at the .01 level for

TABLE 14

Stepwise Regression Summary for Maternal Variable Scores and
Bayley Scales of Infant Development

FEMALES

N = 16

Mental Scale

<u>Variable Entered</u>	<u>Multiple R</u>
Attitude	0.458
Positive Verbal	0.603
Interpersonal Adequacy	0.754* a
Physical Appearance	0.810* a
Negative Verbal	0.831* a
SRI	0.835 a
Teacher-School	0.839
Autonomy	0.842

Motor Scale

<u>Variable Entered</u>	<u>Multiple R</u>
Positive Verbal	0.467
Attitude	0.644*
Physical Appearance	0.743* a
Negative Verbal	0.763* a
Interpersonal Adequacy	0.771
Autonomy	0.774
SRI	0.776
Teacher-School	0.782

Task Oriented Behavior Scale

<u>Variable Entered</u>	<u>Multiple R</u>
Positive Verbal	0.367
Attitude	0.570
Teacher-School	0.668
Autonomy	0.774* a
Physical Appearance	0.839* a
Interpersonal Adequacy	0.891** a
SRI	0.895* a
Negative Verbal	0.897

* p < .05
** p < .01

a - F ratio step increase p < .05
b - F ratio step increase p < .01

TABLE 15: Correlation Matrix --- Female

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Autonomy	1.000	-0.139	-0.004	0.710	0.184	0.271	0.079	-0.019	-0.048	-0.257	-0.185
2. Interpersonal		1.000	0.377	0.085	0.180	-0.292	-0.564	-0.043	-0.331	0.307	-0.089
3. Physical			1.000	0.098	0.243	-0.019	-0.188	-0.164	0.091	0.419	0.304
4. Teacher-				1.000	-0.065	-0.050	0.038	-0.026	0.036	0.005	-0.331
5. Social Reaction					1.000	-0.364	-0.173	-0.215	0.115	0.257	0.321
6. Inventory						1.000	0.157	0.469	-0.131	-0.467	-0.367
7. Negative							1.000	0.122	0.099	-0.299	-0.001
8. Attitude								1.000	0.459	0.173	0.213
9. Bayley Mental									1.000	0.502*	0.729
10. Bayley Motor										1.000	0.573*
11. Bayley Task											1.000
Oriented											
Behavior											

* $p < .05$

steps one through five with the following variables: Positive Verbal Interaction, Interpersonal Adequacy, Physical Appearance, Autonomy, and Mother Attitude. The variable added at each step was significant at the .01 level. The addition of Social Reaction Inventory and Teacher-School Attitude produced a multiple R significant at the .05 level, each addition significant at the .05 level. The Task Oriented Behavior scale showed multiple R's and significant addition of variables in steps two, three, and four. The following variables were significant: Positive Verbal Interaction, Mother Attitude, Autonomy, and Social Reaction Inventory. It can be noticed that, for all three Bayley scales, the first variable entered and the one contributing the major portion of the prediction was Positive Verbal Interaction.

The multiple correlation matrix, Table 17, shows significant intercorrelations for the following variables: negative verbal interaction and teacher-school attitude ($p < .05$); mother attitude, and both positive and negative verbal interaction ($p < .01$); Mental and Motor scales and positive verbal interaction ($p < .05$); Motor scale and attitude ($p < .05$). The Task Oriented Behavior, Mental, and Motor scales correlated with each other at the .01 level. Again, it can be noted that there were significant intercorrelations of both Positive and Negative Verbal Interaction scores and Mother Attitude.

The regression technique reported above shows significant relationships between maternal variables, and the possibility of using maternal variable scores to predict child achievement on the Bayley scales.

This technique demonstrates the mother's life style as a way of

TABLE 16

Stepwise Regression Summary for Maternal Variable Scores and
Bayley Scales of Infant Development

MALES

N = 23

Mental Scale

<u>Variable Entered</u>	<u>Multiple R</u>
Positive Verbal	0.515* a
Interpersonal Adequacy	0.572* a
Physical Appearance	0.701** b
Autonomy	0.742** b
Negative Verbal	0.819** b
Teacher-School	0.829** b
SRI	0.838** b
Attitude	0.842** b

Motor Scale

<u>Variable Entered</u>	<u>Multiple R</u>
Positive Verbal	0.662** b
Interpersonal Adequacy	0.731** b
Physical Appearance	0.749** b
Autonomy	0.758** b
Attitude	0.765** b
SRI	0.767* a
Teacher-School	0.770* a
Negative Verbal	0.775

Task Oriented Behavior Scale

<u>Variable Entered</u>	<u>Multiple R</u>
Positive Verbal	0.389
Attitude	0.519* a
Autonomy	0.610* a
SRI	0.629* a
Teacher-School	0.639
Interpersonal Adequacy	0.643
Physical Appearance	0.683
Negative Verbal	0.684

* p < .05

a - F ratio step increase p < .05

** p < .01

b - F ratio step increase p < .01

TABLE 17: Correlation Matrix -- Male

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Autonomy	1.000	0.148	0.292	0.023	0.287	-0.145	0.181	-0.093	0.050	-0.007	0.240
2. Interpersonal		1.000	0.838**	0.010	-0.191	-0.180	-0.190	-0.313	0.151	0.185	0.181
3. Physical			1.000	-0.038	-0.131	-0.084	-0.164	-0.166	-0.055	0.114	0.102
4. Teacher-School				1.000	0.202	0.099	0.498*	0.043	0.044	0.059	-0.059
5. Social Reaction					1.000	0.048	0.302	0.051	-0.126	0.063	-0.037
6. Positive Inventory						1.000	0.486*	0.854**	0.516*	0.662**	0.390
7. Negative Verbal							1.000	0.564**	0.045	0.347	0.104
8. Attitude								1.000	0.347	0.453*	0.155
9. Bayley Mental Scale									1.000	0.541*	0.601**
10. Bayley Motor Scale										1.000	0.652**
11. Bayley Task Oriented Behavior											1.000

* $p < .05$ ** $p < .01$

relating to her child on more than a single dimension. Life style is a whole, an orientation toward dealing with the environment, and as such, it is proper to view it as a composite of variables.

The data for the E1 group were analyzed separately, including the Estimate of Mother's Expectancy variable. Upon analysis, it was found that the number of variables related to the number of cases was too small to yield any reliable results. The Estimate of Mother's Expectancy showed no significant increase in discriminant function level in any of the cases. The discriminant function patterns were essentially the same as those reported for the total groupings. Therefore, the analysis of these data were not included.

CHAPTER IV

Summary, Discussion and RecommendationsSummary

The major objective of this study was to investigate the relationship of maternal variable scores of disadvantaged Negro mothers to intellectual development of two-year-old Negro infants enrolled in a stimulation training program.

The literature implies that there are differential maternal behaviors in terms of the child's sex, and that the intellectual development of children differs in response to maternal behaviors and stimulation training.

Sample for the study

The sample of subjects used in this study were 39 Negro infants and their mothers, who had participated in the two-year experimental cognitive training program of the Early Child Stimulation through Parent Education project (Gordon, 1969). Three groups were used as a composite experimental group: group E1, born between June, 1966, and January, 1967; and groups E2 and E3, born between May, 1967, and October, 1967. The treatment for the E1 and E2 groups was the same, and although the experimental treatment of the E3 group differed slightly, there were no significant differences between the E3 group and the other two.

Therefore, the C3 group was considered equivalent to the other two for the purposes of this study.

Procedures

The scores on the Bayley Scales of Infant Development, Psycho-motor Development Index, Mental Development Index, and Schaefer's Task Oriented Behavior Index were used as criterion variables. The sample was rank-ordered and divided into the 50 per cent highest-scoring and 50 per cent lowest-scoring groups, for the total sample and by sex. A stepwise discriminant function analysis was conducted for each group, using each of the three Bayley Scale scores as the criterion variable. In addition, the relationships between maternal variable scores was examined, using a stepwise multiple regression analysis for the total group, for total females, and for total males.

The following variables were used as measurements to assess mother-child interactions and maternal attitudes toward self and environment. The How I See Myself Scale (HISM) is a modification, for mothers, of Gordon's HISM (1968), originally developed for children. The scale is a 40-item, five-point, self-report scale, consisting of the following factors: Autonomy, Interpersonal Adequacy, Physical Appearance, and Attitudes toward Teacher-School. The Social Reaction Inventory (SRI), developed by Bilker (1968) as a modification of the Rotter (1966) Internal-External Scale, is a self-report inventory designed to assess attitudes toward mastery of the environment. The Mother's Attitude Scale (MA), developed by Herman (1968), used items appearing on the Parent Educatory Weekly Report as indicative of maternal attitudes

toward the training project. Maternal Verbal Positive Interaction-Maternal Verbal Negative Interaction (Maurelli, 1969) yielded a positive and a negative verbal interaction score, derived from observed frequencies of growth producing and non-growth producing verbal behavior of the mother.

Results

In answer to the first question (Do the mothers of children with high scores on the Bayley Scales of Infant Development show a different pattern of maternal variable scores from children with low Bayley scores?) the only significant discriminant pattern occurred on the Mental scale. Mother Attitude and the Social Reaction Inventory discriminated significantly between the two groups. For all three scales, the high group had a higher Mother Attitude score and a more external Social Reaction Inventory score, even though on the Motor and Task Oriented scales they did not provide discriminants.

Question Two asked: Do the mothers of females with high scores on the Bayley Scales of Infant Development show a different pattern of maternal variable scores than mothers of females with low Bayley scores? The Mental scale showed no significant relationships. The only variable which discriminated for the Motor scale was Positive Verbal Interaction. For the Task Oriented Behavior scale, three of the How I See Myself factors and Positive Verbal Interaction discriminated significantly. The high-scoring group showed trends on all three scales of higher Physical Appearance scores, lower Teacher-School Attitude scores, more external Social Reaction Inventory scores, lower Positive and Negative Verbal Interaction scores and higher Mother Attitude scores.

Question Three asked: Do mothers of males with high scores on the Bayley Scales show a different pattern of maternal variable scores than mothers of males with low scores? Discriminant patterns were found on the Mental and Motor scales, but not on the Task Oriented Behavior scale. The first three variables entered on each scale were Positive Verbal Interaction, Mother Attitude, and Attitude toward Teacher-School. For all three scales, high-scoring males had higher maternal Interpersonal Adequacy scores, higher Positive and Negative Verbal Interaction scores, and higher Mother Attitude scores.

In answer to Question Four (Do high-scoring males and high-scoring females differ in their patterns of maternal variable scores?), the data indicate that there is a discriminant pattern which differentiates between the two groups for all three scales. Positive Verbal Interaction, Interpersonal Adequacy, and Mother Attitude were major discriminators for all three scales, although all the other variables also contribute to the discrimination pattern. Trends indicate higher maternal variable scores and a more internal Social Reaction Inventory score for the males.

Question Five asked: Do low-scoring males and low-scoring females differ in their patterns of maternal variable scores? The only scale which showed a number of discriminants was the Mental scale. Only Positive Verbal Interaction discriminated for the Motor scale. Low-scoring males tended to have mothers who scored higher on all four of the How I See Myself factors, and lower on Positive Verbal Interaction. There were fewer distinctions between low-scoring groups than between the high-scoring groups.

The relationships between the maternal variables was considered in Question Six. The Mental and Motor scales for the total group predicted significantly, using maternal variable scores. Negative Verbal Interaction and Mother Attitude were significant predictors for the Mental scale, while Positive Verbal Interaction, Interpersonal Adequacy and Social Reaction Inventory scores were significant for the Motor scale. Positive and Negative Verbal Interaction were positively correlated with each other, and Negative Verbal Interaction correlated positively with Teacher-School Attitude. Positive Verbal Interaction and Mother Attitude correlated positively with the Mental and Motor scales. It appears that, for the total group, the most important variables positively related to the Bayley scales were Verbal Interaction (Positive and Negative) and Mother Attitude.

For the females, all three Bayley scales showed a significant prediction level, using the maternal variable scores. Verbal Interaction, Positive and Negative, and Mother Attitude, were the most important predictors for all three scales. The only significant correlations between the variables were positive correlations between the three Bayley scales. Although males appear to be influenced more strongly by maternal behaviors, verbal interaction is also important to the prediction of female performance.

The maternal variables appeared to be more important as predictors for the males. More of the variables were involved in the prediction equations for the Mental and Motor scales than were important for the female or the total group. Positive Verbal Interaction contributed most to the prediction equation for each of the three scales. The

measures of the How I See Myself scale were next in level of contribution. Significant intercorrelations were found between Positive and Negative Verbal Interaction and Maternal Attitude. Positive Verbal Interaction correlated with both the Mental and Motor scales. The close relationship between the verbal measures and the Bayley scales is interesting, because the Bayley is not a highly verbal test. Apparently, maternal verbal interaction with her child provides additional stimulus for intellectual development.

Discussion

Trends in the total group toward higher Positive and Negative Verbal Interaction scores reflect trends in the other high groups as well as in the male groups. High Mother Attitude scores are also closely associated with the high groups and with Positive and Negative Verbal Interaction. Mothers with higher Mother Attitude scores may spend more time on the training tasks with their children. Mothers with higher Mother Attitude scores, may, in addition, spend more time with their children overall, and this may result in increased levels of stimulation for the child.

The females did not show the same type of patterns as the males. Fewer maternal variable scores showed any relationship to group discrimination or prediction of Bayley scores. In fact, trends indicated lower maternal variable scores for the high-scoring group. This gives some indication that the way the mother feels about herself and the manner in which she interacts with her child influence females differently than it does males. This supports Lally's (1968) findings that girls

appear to benefit more from experimental training than the boys, and that boys appear to be more affected by maternal variables. Girls showed little relationship between their performance and maternal variables.

Behaviors of the mother toward her child, especially a more favorable maternal attitude toward herself, relate to higher intellectual development in males, whereas they do not appear to relate in any consistent way to the development of females. This supports the Kagan and Moss (1962) findings of maternal treatment for boys as the best predictor of child and adult intellectual achievement, but not for females.

Why does maternal behavior affect boys and girls differently? It has been hypothesized by Bayley (1965) that there are some genetic differences which probably determine the differential responses of boys and girls. It appears to the author that some of the differing responses and behaviors in the current sample may be explained in the light of the nature of the sample. Black cultural values do not emphasize the value of the male. They underemphasize his preparation to take an active part in society. Most of the cultural emphasis revolves around the female, as it is the woman who bears the primary responsibility for child rearing and for providing stability for the family. It might, therefore, seem that there is a consistent emphasis on achievement for girls but not for boys. Therefore, a mother might expect more from her daughter with less maternal direction, and exert less pressure on her sons while spending more time with them. Also, if the pressures of the culture are toward female achievement, then perhaps

there is more external stimulation for females, and less for males. If this is true, then the stimulation provided by the mother for her male children assumes greater importance for males than it does for females. The scarcity of male models for boys also makes it likely that stimulation and attention from the mother will assume more importance for the male, since there are generally a greater number of female models available for the girls.

The results indicate that maternal variables can predict performance for all groups, but that prediction is improved by splitting the groups by sex. When that is done, the maternal variables predict more accurately for the males. This emphasizes the importance of maternal treatment of males. Males seem to be more susceptible to how the mother behaves, and maternal behavior appears, in some way, to affect their intellectual performance.

If maternal treatment of males has an effect on the development of their intellectual behavior, then what implications does this have for the development of infant training programs? It would seem from the evidence thus far accumulated from infant training programs that intellectual stimulation training has the most effect on girls and that emphasis on this training for females should be continued. However, males do not equally benefit from training, and, therefore, it would seem feasible to develop a different type of program for males. Since there is such an important relationship between male intellectual performance, how the mother feels about herself, and how she relates to her son, a program which emphasized positive maternal growth in self-perceptions and verbal relationships with her children might prove to be of value for males.

The most interrelated variables were mainly the Verbal Interaction measures, the Mental and Motor scales, and Mother Attitude, although there was some interrelationship of Positive and Negative Verbal Interaction to the How I See Myself factors, especially Teacher-School Attitude. The verbal nature of the school situation may bear some weight in the high relationship of verbal measures to the Teacher-School Attitude factor.

Soar (1970) found that among teachers there was little relationship between positive and negative verbal behavior. However, this was not the case with students. Children who were high on positive verbal interactions were also high on negative verbal interactions. That is, children whose verbal output was high displayed more verbal interaction of both kinds than children whose verbal interactions were low. It is interesting to note that the mothers in this study resemble more closely the children in the Soar study than the teachers. Mothers appear to be high on both Positive and Negative Verbal Interaction. High intercorrelations between the Verbal Interaction measures were found for all groups. Mother Attitude also seems to be closely related to level of verbal interaction. Both Positive and Negative Verbal Interaction were highly correlated with Maternal Attitude toward training. This may be due to the nature of the attitude scoring which uses many verbal responses in scoring.

The high intercorrelations between Positive and Negative Verbal Interaction, and the fact that for all the discriminant functions either one or the other of the verbal measures always was found as the major contributor to the discrimination, evoke some question about the validity

of the division of Verbal Interaction measures. The determination of Positive and Negative is a value judgment. Perhaps the effects of both types of interactions have a growth-producing effect on children in this kind of population. The types of behaviors which we determine as Negative represent a middle-class judgment. Some types of interactions thought to be harmful by middle-class psychologists obviously are not. Therefore, it seems a logical step to discard the labels Positive and Negative, and to merge the two categories into one. Further investigation would then be needed to judge the merit of this action.

The potency of the maternal measures and their relationship to child performance, especially for the males, demonstrates the potency of the multiple analysis technique. These were measures collected by paraprofessional parent educators, many of them based on merely observations in the home recorded by the parent educators on a random basis. Several of the measures were self-report measures administered during a visit of the parent educator or when the child was brought to the center for testing. Nevertheless, they show significant contribution to prediction of Bayley scores and to discrimination between high-scoring and low-scoring males and females. Obviously adult patterns of behavior, the mother's life style, influence the achievement patterns of their children. Mothers' life style is not a single attribute, nor can any one attribute characterize her relationships. Therefore, we must consider the total of the mother's behaviors as a multiplicity of factors, a technique for dealing with her environment.

Recommendations

As interaction patterns are studied, they lead to an ever-widening field of possibilities to be explored. The results of this research have raised additional questions, and the following recommendations are proposed:

1. The kinds of verbalizations between mother and child need to be examined in more detail. Perhaps specific kinds of maternal verbalizations account for the enhancement of performance that has been demonstrated.
2. Using additional observation techniques, such as video tapes, non-verbal communication between mother and child may be a fruitful area of investigation. We do not now know how much of the mother's communication with her child is of a non-verbal variety or its effects on the child's development.
3. Further research should be carried out to investigate the relationship of maternal discipline and maternal How I See Myself and Social Reaction Inventory variable scores. That is, how do mothers who use strict discipline view themselves, compared with mothers using less rigid methods of disciplining their children?
4. Further research needs to be undertaken to understand more fully the differing maternal behavior of mothers toward males and females.
5. The measurement of maternal variables has been done mainly by self-report and by crude types of loosely controlled observation. Therefore, there is a strong chance that the variable scores reported may be influenced by the weakness of the assessment methods, and this

weakens the strength of the findings. Therefore, we need to do further research on ways of refining the measurement of maternal behaviors.

6. Maternal variable scores reflect the life style of the mother. They represent her techniques for dealing with her environment. We need to investigate how these maternal variables relate to the mother as a teacher. The mother is the first teacher of her child, and infant stimulation programs stress the use of the mother in teaching her child. Perhaps it is in improving the mother's view of herself and her teaching techniques that we will find an effective method of early child teaching and stimulation.

APPENDICES

APPENDIX A

"How I See Myself Scale"

I would like to explain this scale to you and tell you why you are being asked to answer these questions. This is a part of a study. We are trying to get information that we hope will eventually help us provide a better life for your child.

Let me emphasize that this is not a test to see how much you know or do not know about something. These questions are all about you. They are to learn how you see yourself most of the time. There are no right or wrong answers. We are only interested in what you think about yourself.

I am going to ask you to think about yourself for a little while before you write anything. I want you to think of how you are most of the time ... not how you think you ought to be ... not how your husband or friends want you to be. No -- this is to be how you yourself feel you are most of the time.

Let me first promise you that these papers will not be seen by anyone other than the people making this study. No one will know your answers but you and the ones who are doing this study. We are asking you to put your names on the papers so that we can check them on any other scales we might give you in the future.

Now -- let's look at the papers.

Look at No. 1. On the side it has "Nothing gets me mad" and on the other side, "I get mad easily and explode." If you feel that nothing gets you too mad most of the time, you would circle the 1. If you feel that most of the time you get mad easily and explode, you would circle the 5. If you feel you are somewhere in between, you would circle the 2, 3 or 4.

Look at No. 2. It is different. On one side, it has "I don't stay with something till I finish." If you feel that most of the time you don't stay with things and finish them, you would circle a 1. If you feel that most of the time you do stay with things and finish, you circle the 2, 3 or 4. It is important to see that some of these mean one thing on the left side, some of them mean another. So it is important to think about each statement as I read it. I will answer any questions you need answered, so feel free to ask them.

Remember, we want how you yourself feel. We want you to be honest with us in your answer. Remember, it is how you feel most of the time.

HOW I SEE MYSELF SCALE

- | | | |
|---|-----------|--|
| 1. Nothing gets me too mad | 1 2 3 4 5 | I get mad easily and explode |
| 2. I don't stay with things and finish them | 1 2 3 4 5 | I stay with something till I finish |
| 3. I'm very good at drawing | 1 2 3 4 5 | I'm not much good in drawing |
| 4. I don't like to work with others | 1 2 3 4 5 | I like to work with others |
| 5. I wish I were smaller (taller) | 1 2 3 4 5 | I'm just the right height |
| 6. I worry a lot | 1 2 3 4 5 | I don't worry much |
| 7. I wish I could do something with my hair | 1 2 3 4 5 | My hair is nice-looking |
| 8. People like me | 1 2 3 4 5 | People don't like me |
| 9. I've lots of energy | 1 2 3 4 5 | I haven't much energy |
| 10. I am ignored at parties | 1 2 3 4 5 | I am a hit at parties |
| 11. I'm just the right weight | 1 2 3 4 5 | I wish I were heavier (lighter) |
| 12. Women don't like me | 1 2 3 4 5 | Women like me a lot |
| 13. I'm very good at speaking before a group | 1 2 3 4 5 | I'm not much good at speaking before a group |
| 14. My face is pretty (good looking) | 1 2 3 4 5 | I wish I were prettier (good looking) |
| 15. I'm very good in music | 1 2 3 4 5 | I'm not much good in music |
| 16. I get along well with teachers | 1 2 3 4 5 | I don't get along with teachers |
| 17. I don't like teachers | 1 2 3 4 5 | I like teachers very much |
| 18. I don't feel at ease, comfortable inside myself | 1 2 3 4 5 | I feel very at ease, comfortable inside myself |
| 19. I don't like to try new things | 1 2 3 4 5 | I like to try new things |

20.	I have trouble controlling my feelings	1 2 3 4 5	I can handle my feelings
21.	I did well in school work	1 2 3 4 5	I didn't do well in school
22.	I want men to like me	1 2 3 4 5	I don't want men to like me
23.	I don't like the way I look	1 2 3 4 5	I like the way I look
24.	I don't want other women to like me	1 2 3 4 5	I want other women to like me
25.	I'm very healthy	1 2 3 4 5	I get sick a lot
26.	I don't dance well	1 2 3 4 5	I'm a very good dancer
27.	I write well	1 2 3 4 5	I don't write well
28.	I like to work alone	1 2 3 4 5	I don't like to work alone
29.	I use my time well	1 2 3 4 5	I don't know how to plan my time
30.	I'm not much good at making things with my hands	1 2 3 4 5	I'm very good at making things with my hands
31.	I wish I could do something about my skin	1 2 3 4 5	My skin is nice-looking
32.	Housework isn't interesting to me	1 2 3 4 5	Housework is very interesting
33.	I don't do my housework well	1 2 3 4 5	I do a good job at housework
34.	I'm not as smart as the others	1 2 3 4 5	I'm smarter than most of the others
35.	Men like me a lot	1 2 3 4 5	Men don't like me
36.	My clothes are not as I'd like	1 2 3 4 5	My clothes are nice
37.	I liked school	1 2 3 4 5	I didn't like school
38.	I wish I were built like others	1 2 3 4 5	I'm happy with the way I am

39. I don't read well 1 2 3 4 5 I read very well
40. I don't learn new things easily 1 2 3 4 5 I learn new things easily

Name _____ Age _____ Usual Job _____ School Grade Completed _____
 Number of Children _____ Trainer _____

SOCIAL REACTION INVENTORY

Instructions

This is a questionnaire to find out the way in which certain events in our society affect different people. Each question has two choices, called a or b. Please choose the one of each pair (and only one) which you more strongly believe to be the case as far as you are concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief; obviously there are no right or wrong answers.

For each question, after I read both remarks to you, put a circle around a if you believe remark a more strongly; put a circle around b if you believe remark b more strongly. After each question tell me when you have made your choice. Then I will read the next one. Feel free to ask me to read any question over again. Be sure to print your name and other information asked for at the top of the page. Please do this now.

In some instances you may discover that you believe both remarks or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you are concerned. Also try to respond to one question at a time when making your choice; do not

be influenced by your previous choices. REMEMBER, in each case, choose the remark which you personally believe to be more true.

I More Strongly Believe That:

1. a. Children get into trouble because their parents punish them too much.
b. The trouble with most children today is that their parents are too easy with them.
2. a. Many of the unhappy things in people's lives are partly due to bad luck.
b. People's troubles result from the mistakes they make.
3. a. One of the biggest reasons why we have wars is because people don't take enough interest in government.
b. There will always be wars, no matter how hard people try to prevent them.
4. a. In the long run people get the respect they deserve in this world.
b. It is the sad truth that an individual's worth often passes without being recognized no matter how hard he tries.
5. a. The idea that teachers are unfair to students is "hot air."
b. Most students don't realize how much their grades are influenced by accident or chance.
6. a. Without the right breaks, one cannot be a good and able leader.
b. Able people who fail to become leaders have not taken advantage of their opportunities.
7. a. No matter how hard you try, some people just don't like you.
b. People who can't get others to like them don't understand how to get along with others.
8. a. What a person is born with plays the biggest part in determining what they're like.
b. It is one's experiences in life which determine what they're like.
9. a. I have often found that what is going to happen will happen.
b. Putting trust in fate has never turned out as well for me as making a plan to take a certain course of action.

10. a. In the case of the well prepared student there is hardly ever such a thing as an unfair test.
b. Many times test questions tend to be so different from class work, that studying is really a waste of time.
11. a. Becoming a success is a matter of hard work; luck has little or nothing to do with it.
b. Getting a good job depends mainly on being in the right place at the right time.
12. a. The average citizen can have an influence in government plans.
b. This world is run by the few people in power, and there is not much the little guy can do about it.
13. a. When I make plans, I am almost certain that I can make them work.
b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad luck anyhow.
14. a. There are certain people who are just no good.
b. There is some good in everybody.
15. a. In my case, getting what I want has little or nothing to do with luck.
b. Many times we might just as well decide what to do by tossing a coin.
16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
b. Getting people to do the right thing depends upon being able; luck has little or nothing to do with it.
17. a. As far as world affairs are concerned, most of us are pushed around by forces we can neither understand nor control.
b. By taking an active part in government and social affairs the people can control world events.
18. a. Most people don't realize the point to which their lives are controlled by accident and chance.
b. There is really no such thing as "luck."

19. a. One should always be willing to admit his mistakes.
b. It is usually best to cover up one's mistakes.
20. a. It is hard to know whether or not a person really likes you.
b. How many friends you have depends upon how nice a person you are.
21. a. In the long run the bad things that happen to us are made up for by the good ones.
b. Most troubles are the result of lack of know-how, lack of knowledge, being lazy, or all three.
22. a. With enough effort we can clean up dirty government.
b. It is difficult for people to have much control over the things government leaders do in office.
23. a. Sometimes I can't understand how teachers arrive at the grades they give.
b. The harder I study the better grades I get.
24. a. A good leader expects people to decide for themselves what they should do.
b. A good leader makes it clear to everybody what their jobs are.
25. a. Many times I feel that I have little influence over the things that happen to me.
b. It is impossible for me to believe that chance or luck plays an important part in my life.
26. a. People are lonely because they don't try to be friendly.
b. There's not much use in trying too hard to please people -- if they like you, they like you.
27. a. There is too much emphasis on athletics in high school.
b. Team sports are an excellent way to build character.
28. a. What happens to me is my own doing.
b. Sometimes I feel that I don't have enough control over the direction my life is taking.

29. a. Most of the time I can't understand why politicians behave the way they do.
- b. In the long run the people are responsible for bad government on a national as well as a local level.

1. Nothing was going on besides the training _____
2. Other activities were going on but did not attract the attention of the baby

3. Other activities in the room often pulled the baby's attention away from the training _____
4. There was such a great deal of activity in the room that it made it difficult to present the exercises _____

3. Series Information:

- A) How did the mothering one react to your instructions?
1. Looked at you while you were talking, and/or asked questions _____
 2. Did other things while you were showing how to do the exercise (examples of other things: straightened baby's clothes, looked around the room, did housework) _____
 3. Walked out of the room while you were explaining things to her _____
 4. Refused to do an exercise _____
 5. Laughed at and/or scoffed at instructions _____
 6. Other _____ What? _____
- B) Mothering one's ability to repeat exercises:
1. Could repeat exercises the trainer had explained to her _____
 2. Could do part of the exercise by herself but needed the trainer's help _____
 3. Couldn't repeat exercises the trainer had explained to her _____
- C) What was the child's response to objects used?
1. Did not look at or any way indicate interest in objects _____
 2. Glanced at and held objects briefly but did not explore them _____
 3. Played with materials when presented, but lost interest in them after a brief reaction _____
 4. Kept up interest in each item presented _____
 5. Didn't want to give up materials _____
- D) When the mothering one goes over last week's exercises with her child she:
1. Doesn't know what she's doing _____
 2. Knows what she's doing _____
- E) When the mothering one goes over last week's exercises with her child she:
1. Tries them on the child more than once if it doesn't go well the first time _____
 2. Gets discouraged or is satisfied after doing them once even if they didn't go well the first time _____
 3. Does them more than once if they go very well the first time _____

F) How many interruptions were there during training that made the mothering one stop the exercise for a time? None _____, 1 _____, 2 _____, 3 _____, 4 _____, 5 _____, More _____

G) What kinds of interruptions were there?

1. Mothering one had to care for another child _____
2. An adult wanted something _____
3. The phone rang _____
4. Visitors came _____
5. The baby had to be fed _____
6. The baby went to sleep _____
7. Other _____
8. None _____

H) What other types of activities were presented by the trainer to the mothering one?

- | | |
|-------------------------|----------------------------|
| 1. Songs _____ | 4. Rhythm Games _____ |
| 2. Nursery Rhymes _____ | 5. Other _____ What? _____ |
| 3. Toy Making _____ | 6. None _____ |

I) Check if you observed:

1. Homemade toys around the house _____
2. Mobiles hanging by baby's bed _____
3. Mothering one using songs or games you showed her _____
4. Other _____
5. None of the above _____

4. Baby's Health and Development:

A) Did the mothering one say the baby was sick?

1. She said the baby was sick _____
 2. She said the baby was not sick _____
 3. She did not say whether the baby was sick or not _____
- If the mothering one said the baby was sick, explain:
- _____
- _____

B) Did you think the baby was sick? 1. Yes _____ 2. No _____

Explain if you have a different idea than the mothering one:

C) What has the baby learned to do since you saw him last in addition to the series?

1. Rolls from side to side _____
2. Sits alone for a short time without support _____

3. Crawls (creeps on hands and knees) _____
4. Walks alone _____
5. Climbs on low chair _____
6. Runs or jumps _____
7. Climbs to a stand on chair _____
8. None of the above _____

D) How many clear words does the baby use?

1. Makes sounds, but no clear words _____
2. Babbles, but no clear words _____
3. 1 word _____
4. 2 or 3 words _____
5. 4 or 5 words _____
6. 6 to 9 words _____
7. 10 to 14 words _____
8. 15 to 20 words _____
9. More than 20 words _____

5. Social Information:

A) When the mothering one is in the room the child:

1. Watches her _____
2. Tries to get to her _____
3. Goes on as if mothering one wasn't in the room _____
4. Tries to get her attention _____
5. Other _____

B) When the mothering one comes near the child he:

1. Frowns _____
2. Watches her _____
3. Laughs _____
4. Cries _____
5. Smiles _____
6. Vocalizes _____
7. Reaches for her _____
8. Ignores her _____
9. Other _____ What? _____

6. Verbal Information:

A) To what extent do people talk to the baby?

1. No one talks to the baby _____
2. The one working with the baby talks to the baby about things with which they are working _____
3. The one working with the baby talks to the baby about things besides those with which they are working _____
4. People other than the one working with the baby talk to baby _____

B) Who talks to baby most : M : F : S : GM : A : BS : Other : Nobody :
 of the time (more than : : : : : : : : :
 half the time) : : : : : : : : :

How people talk to or about the baby:

C) Look directly into his : : : : : : : : :
 face : : : : : : : : :
 D) Talk about him as though : : : : : : : : :
 he were not there : : : : : : : : :

- | | M | F | S | GM | A | BS | Other | Nobody | | | |
|---|---|---|---|----|---|----|-------|--------|---|---|-------|
| E) Talk sounds rather than words (example: coo, goo) | : | : | : | : | : | : | : | : | | | |
| F) Talk words rather than than sounds | : | : | : | : | : | : | : | : | | | |
| G) Their tone of voice sounds soft and loving | : | : | : | : | : | : | : | : | | | |
| H) Their tone of voice sounds cross and angry | : | : | : | : | : | : | : | : | | | |
| I) Use the baby's name (or nickname) when speaking to him | : | : | : | : | : | : | : | : | | | |
| J) Repeat sounds the baby makes in a questioning way | : | : | : | : | : | : | : | : | | | |
| K) Interpret to others what the baby says | : | : | : | : | : | : | : | : | | | |
| L) Listen to the baby when the baby talks | : | : | : | : | : | : | : | : | | | |
| M) In a few words, order or tell the baby to do/not do things | : | : | : | : | : | : | : | : | | | |
| N) Explain and describe things when talking to the baby | : | : | : | : | : | : | : | : | | | |
| O) How many words are there in most of the sentences spoken to the baby by the mothering one? | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | _____ |

Give 2 sentences used by mothering one while talking to the baby:

7. Missed Appointments and Delays:

- A) Was the beginning of training delayed today?

Yes _____ No _____

- B) If yes, why? Because the mothering one wanted to:

- | | |
|------------------------------|---|
| 1. eat _____ | 6. finish talking with friends or relatives _____ |
| 2. feed the baby _____ | 7. care for older children _____ |
| 3. do housework _____ | 8. let the baby sleep _____ |
| 4. dress the baby _____ | 9. Other _____ |
| 5. get dressed herself _____ | |

- C) How many trips did you make before you got to see the mothering one for this visit? _____ If you made more than one visit answer the following:

D) Did the mothering one leave a message for you on any of the trips?

Yes _____

No _____

E) When you finally got to see the mothering one:

1. She said nothing about missing her appointment _____
2. She gave a confusing explanation _____
3. She gave an understandable explanation _____

Index of Positive Verbal Interaction

$$\text{Pos. VI} = \frac{\text{tally of positive indicators}}{11.0 \times \text{no. of visits}}$$

Items tallied if checked

- | | |
|--------|--------|
| 1. 6 C | 5. 6 J |
| 2. 6 F | 6. 6 K |
| 3. 6 G | 7. 6 L |
| 4. 6 I | 8. 6 N |

6 0 if sentence length 1 - 2 or 3 tally 1
 4 - 5 or 6 tally 2
 7 - 8 or 9 tally 3

Total possible tallies per PEWR = 11

Limits on index

0 pos. VI 1

Index of Negative Verbal Interaction

$$\text{Neg. VI} = \frac{\text{tally of negative indicators}}{4 \times \text{no. of visits}}$$

Items tallied negative if checked

- | | |
|--------|--------|
| 1. 6 D | 3. 6 H |
| 2. 6 E | 4. 6 M |

Total possible tallies per PEWR = 4

Limits on index

0 neg. VI 1

Estimate of Mother's Expectancy

The word in the box is the one we want your opinion about:

--

*Slow	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Fast
*Strong	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Weak
*Crying	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Laughing
Hot	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Cold
*Quiet	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Noisy
*Clean	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Dirty
*Smooth	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Rough
*Wise	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Foolish
*Bad	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Good
Brave	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Afraid
Calm	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Emotional
*Dark	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Light
*Dull	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Sharp
*Beautiful	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Ugly
Indoors	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Outdoors
*Hard	: _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ : _ _ _ _ _ :	Soft

* Used for analysis of Ideal Baby Boy, Ideal Baby Girl, and This Child

APPENDIX B

Means and Standard Deviations of Maternal Variable
Scores and Bayley Scales of Infant Development for
Total Group

Variable	Mean	Standard Deviation
Autonomy	23.435	4.822
Interpersonal Adequacy	61.076	14.553
Physical Appearance	28.102	5.495
Teacher-School	22.256	5.309
SRI	10.600	3.456
Positive Verbal	0.649	0.234
Negative Verbal	0.182	0.135
Attitude	0.581	0.232
Bayley Mental Scale	86.461	14.883
Bayley Motor Scale	106.128	16.106
Bayley Task Oriented Behavior Scale	25.282	5.675

Means and Standard Deviations of Maternal Variable
Scores and Bayley Scales of Infant Development for
Females

Variable	Mean	Standard Deviation
Autonomy	22.187	3.850
Interpersonal Adequacy	56.812	14.761
Physical Appearance	26.312	4.206
Teacher-School	20.687	4.949
SRI	10.250	3.890
Positive Verbal	0.640	0.192
Negative Verbal	0.160	0.104
Attitude	0.560	0.200
Bayley Mental Scale	91.375	11.842
Bayley Motor Scale	106.625	10.917
Bayley Task Oriented Behavior Scale	27.812	4.636

Means and Standard Deviations of Maternal Variable
Scores and Bayley Scales of Infant Development for
Males

Variable	Mean	Standard Deviation
Autonomy	24.304	5.303
Interpersonal Adequacy	64.043	13.959
Physical Appearance	29.347	6.012
Teacher-School	23.347	5.381
SRI	9.826	3.200
Positive Verbal	0.656	0.246
Negative Verbal	0.197	0.153
Attitude	0.596	0.255
Bayley Mental Scale	83.043	16.038
Bayley Motor Scale	105.782	19.145
Bayley Task Oriented Behavior Scale	23.521	5.751

Stepwise Regression Summary -- Standard Error, R Squared, Increase in R Squared, and F Ratio for Maternal Variable Scores

TOTAL GROUP

N = 39

Mental Scale

Variable	Standard Error	R Squared	Increase R Squared	df	F Ratio
Attitude	14.179	0.116	0.116	1/37	4.870**
Negative Verbal	14.186	0.139	0.022	2/36	2.912
Positive Verbal	14.371	0.153	0.013	3/35	2.109
Physical Appearance	14.450	0.156	0.003	4/34	1.577
SRI	14.652	0.158	0.001	5/33	1.242
Teacher-School	14.873	0.159	0.000	4/32	1.008
Autonomy	15.108	0.159	0.000	7/31	0.840

Motor Scale

Variable	Standard Error	R Squared	Increase R Squared	df	F Ratio
Positive Verbal	14.893	0.161	0.161	1/37	7.446**
Interpersonal Adequacy	14.332	0.249	0.082	2/36	5.997**
SRI	14.219	0.292	0.032	3/35	4.585**
Autonomy	14.263	0.298	0.016	4/34	3.613*
Attitude	14.333	0.312	0.014	5/33	2.997*
Negative Verbal	14.500	0.317	0.005	6/32	2.481*
Physical Appearance	14.706	0.314	0.002	7/31	2.083
Teacher-School	14.934	0.320	0.000	8/30	1.771

Task Oriented Behavior Scale

Variable	Standard Error	R Squared	Increase R Squared	df	F Ratio
Teacher-School	5.599	0.052	0.523	1/37	2.041
Positive Verbal	5.597	0.078	0.026	2/36	1.528
SRI	3.604	0.101	0.023	3/35	1.324
Physical Appearance	5.667	0.107	0.005	4/34	1.025
Autonomy	5.741	0.110	0.002	5/33	0.818
Attitude	5.830	0.111	0.001	6/32	0.668
Negative Verbal	5.922	0.111	0.000	7/31	0.557

* p < .05

** p < .01

Stepwise Regression Summary -- Standard Error, R Squared, Increase in R Squared, and F Ratio for Maternal Variable Scores

FEMALES

N = 16

Mental Scale

Variable	Standard Error	R Squared	Increase R Squared	df	F Ratio
Attitude	10.892	0.210	0.210	1/14	3.731
Positive Verbal	10.141	0.364	0.154	2/13	3.727
Interpersonal Adequacy	8.675	0.570	0.206	3/12	5.317*
Physical Appearance	8.094	0.657	0.086	4/11	5.277*
Negative Verbal	8.051	0.891	0.034	5/10	4.440*
SRI	8.392	0.698	0.006	6/9	3.478*
Teacher-School	8.819	0.704	0.005	7/8	2.721
Autonomy	9.350	0.709	0.004	8/7	2.133

Motor Scale

Variable	Standard Error	R Squared	Increase R Squared	df	F Ratio
Positive Verbal	9.991	0.218	0.218	1/14	3.910
Attitude	8.967	0.415	0.197	2/13	4.616
Physical Appearance	8.159	0.553	0.137	3/12	4.951*
Negative Verbal	8.237	0.582	0.029	4/11	3.836*
Interpersonal Adequacy	8.513	0.594	0.012	5/10	2.933
Autonomy	8.914	0.600	0.005	6/9	2.250
SRI	9.414	0.603	0.003	7/8	1.738
Teacher-School	9.954	0.612	0.008	8/7	1.380

Task Oriented Behavior Scale

Variable	Standard Error	R Squared	Increase R Squared	df	F Ratio
Positive Verbal	4.463	0.135	0.135	1/14	2.185
Attitude	4.089	0.325	0.190	2/13	3.140
Teacher-School	3.844	0.447	0.121	3/12	3.235
Autonomy	3.425	0.599	0.152	4/11	4.121*
Physical Appearance	3.087	0.704	0.104	5/10	4.767*
Interpersonal Adequacy	2.715	0.794	0.089	6/9	5.788*
SRI	2.820	0.802	0.008	7/8	4.648*
Negative Verbal	2.997	0.805	0.002	8/7	3.612

* $p < .05$

Stepwise Regression Summary -- Standard Error, R Squared, Increase in R Squared, and F Ratio for Maternal Variable Scores

MALES

N = 23

Mental Scale

Variable	Standard Error	R Squared	Increase R Squared	df	F Ratio
Positive Verbal	14.062	0.266	0.266	1/21	7.617*
Interpersonal Adequacy	13.791	0.327	0.061	2/20	4.876*
Physical Appearance	12.303	0.491	0.164	3/19	6.128**
Autonomy	11.886	0.550	0.058	4/18	5.513**
Negative Verbal	10.463	0.671	0.120	5/17	6.938**
Teacher-School	10.492	0.688	0.017	6/16	5.900**
SRI	10.594	0.702	0.013	7/15	5.060**
Attitude	10.831	0.709	0.007	8/14	4.280**

Motor Scale

Variable	Standard Error	R Squared	Increase R Squared	df	F Ratio
Positive Verbal	14.685	0.438	0.438	1/21	16.392**
Interpersonal Adequacy	13.702	0.534	0.095	2/20	11.474**
Physical Appearance	13.636	0.561	0.027	3/19	8.122**
Autonomy	13.806	0.574	0.012	4/18	6.077**
Attitude	14.007	0.586	0.021	5/17	4.819**
SRI	14.380	0.589	0.003	6/16	3.833*
Teacher-School	14.780	0.593	0.003	7/15	3.126*
Negative Verbal	15.156	0.601	0.007	8/14	2.638

Task Oriented Behavior Scale

Variable	Standard Error	R Squared	Increase R Squared	df	F Ratio
Positive Verbal	5.421	0.152	0.152	1/21	3.763
Attitude	5.516	0.269	0.117	2/20	3.686*
Autonomy	4.901	0.372	0.103	3/19	3.763*
SRI	4.943	0.395	0.022	4/18	2.946*
Teacher-School	5.032	0.408	0.012	5/17	2.347
Interpersonal Adequacy	5.160	0.414	0.006	6/16	1.888
Physical Appearance	5.083	0.467	0.052	7/15	1.881
Negative Verbal	5.258	0.468	0.000	8/14	1.539

* p < .05

** p < .01

APPENDIX C

Maternal Variables and Child Performance Scores

Case	Autonomy	Interpersonal Adequacy	Physical Appearance	Teacher School	Social Reaction Inventory	Positive Verbal	Negative Verbal	Mother Attitude	Mental	Motor	Task Oriented Behavior
1 M	31	81	39	27	08	0.573	0.073	0.287	079	103	025
2 M	26	71	32	25	14	0.022	0.000	0.049	058	074	017
3 M	26	75	40	20	11	0.792	0.056	0.604	087	131	027
4 F	17	64	28	14	12	0.718	0.086	0.722	108	107	032
5 F	21	67	29	23	05	0.761	0.224	0.580	079	106	024
6 F	27	48	26	22	13	0.852	0.212	0.125	072	082	020
7 M	24	70	32	28	14	0.841	0.211	0.694	100	145	033
8 F	26	71	36	26	15	0.322	0.057	0.311	104	131	035
9 F	25	72	28	27	13	0.545	0.090	0.462	077	106	022
10 F	24	54	24	19	16	0.451	0.077	0.504	090	108	031
11 F	12	51	24	10	08	0.345	0.212	0.244	084	113	030
12 F	23	50	24	16	14	0.672	0.178	0.671	096	101	033

Case	Autonomy	Interpersonal Adequacy	Physical Appearance	Teacher School	Social Reaction Inventory	Positive Verbal	Negative Verbal	Mother Attitude	Mental	Motor	Task Oriented Behavior
13 M	24	53	25	19	13	0.649	0.176	0.641	077	109	030
14 M	21	53	22	19	08	0.636	0.165	0.636	071	117	021
15 M	22	52	26	16	11	0.738	0.220	0.659	075	097	026
16 M	13	55	29	22	06	0.680	0.165	0.823	074	087	021
17 F	18	69	32	18	12	0.470	0.081	0.520	089	111	030
18 M	32	62	32	24	14	0.486	0.234	0.462	059	071	020
19 F	24	53	23	19	13	0.740	0.365	0.738	088	105	027
20 M	30	25	17	26	10	0.900	0.397	0.841	088	108	024
21 M	32	79	40	26	10	0.966	0.434	0.894	094	121	029
22 M	28	71	30	24	11	0.640	0.190	0.814	081	096	018
23 F	24	60	22	26	10	0.596	0.205	0.757	108	116	032
24 M	18	72	30	18	08	0.165	0.041	0.167	072	078	015
25 M	17	62	25	17	09	0.896	0.046	0.457	087	118	027

Case	Autonomy	Interpersonal Adequacy	Physical Appearance	Teacher School	Social Reaction Inventory	Positive Verbal	Negative Verbal	Mother Attitude	Mental	Motor	Task Oriented Behavior
26 M	19	75	30	22	08	0.793	0.210	0.702	091	131	026
27 F	21	72	28	25	08	0.562	0.209	0.608	089	103	024
28 M	26	61	23	21	10	0.752	0.017	0.662	136	102	029
29 M	23	71	33	25	13	0.848	0.458	0.860	078	114	013
30 M	30	63	25	25	14	0.869	0.528	0.833	093	131	030
31 F	22	58	18	24	07	0.636	0.000	0.527	087	105	020
32 M	22	38	24	22	09	0.527	0.117	0.720	064	087	014
33 F	26	26	25	24	03	0.670	0.303	0.537	100	090	029
34 M	14	55	22	43	11	0.806	0.417	0.600	083	102	020
35 M	32	78	31	25	06	0.025	0.130	0.000	080	101	028
36 M	20	81	36	22	01	0.838	0.181	0.800	094	112	029
37 F	23	69	27	16	05	1.017	0.024	0.781	080	105	027
38 M	24	70	31	21	07	0.652	0.015	0.518	089	098	019

Task Oriented Behavior	029
Motor	117
Mental	110
Mother Attitude	0.811
Negative Verbal	0.250
Positive Verbal	0.900
Social Reaction Inventory	10
Teacher School	21
Physical Appearance	28
Interpersonal Adequacy	25
Autonomy	22
Case 39 F	

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BIOGRAPHICAL SKETCH

Susan Jane Herman was born in Chicago, Illinois, on May 2, 1939. She attended public schools in Chicago and Detroit, Michigan. She attended the University of Michigan, University of Arizona, and University of Maryland, receiving her Bachelor of Arts degree from the European Division of the University of Maryland in June, 1962. She obtained her master's degree in counseling from Rollins College in June, 1965.

From 1962 to 1964, she worked as a substitute teacher in Munich, Germany; Bergen County, New Jersey; and Orange County, Florida. From 1964 to 1966, she worked as a public school teacher of third grade and exceptional children. She was a counselor for a Manpower Development Training Act school and then a senior high school counselor until her enrollment in the Graduate School of the University of Florida, where she has pursued work toward the degree of Doctor of Philosophy. From 1968 to 1969, she taught psychology and was a part-time counselor at Valencia Junior College, Orlando, Florida.

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